Title: CIMMYT Improving nitrous oxide estimates globally

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2018	F3	Wollenberg, Lini <Lini.wollenberg@uvm.edu>

Funding source types	Status	Lead Organization	Project leader
W1/W2, Bilateral	On-going	CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo - Mexico	Stirling, Clare <c.stirling@cgiar.org>

Project is working on

Flaship(s)
F3 (Lini): Low emissions development

Region(s)
Global

Project summary

Effective low-emission development policies depend on accurate, spatially-explicit estimates of GHG emissions that respond to variable soil, climate and management (SCM). Current assumptions of N2O emissions as a simple percentage of nitrogen (N) fertilization rate are insufficient to identify hotspots and may result in up to a five-fold underestimate of actual emissions according to recent research. At present, there is no fit-for-purpose scalable model to estimate GHG emissions nor are there sufficient data available for adapting or designing suitable SCM-responsive models for GHG emissions in tropical and subtropical wheat- and maize-based cropping systems. This project proposes to address these issues by posing the following questions: 1) How can models better quantify N-related smallholder GHG mitigation options? 2) How do data requirements, scale, and end-user objectives influence model selection for assessing mitigation priorities? 3) What are the critical trade-offs/synergies between GHG mitigation practices and other smallholder objectives?

2. Partners

Partner #1 (Leader)

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Stirling, Clare <c.stirling@cgiar.org>	Activity 2014-127 *Partner*. Activity 2014-128 *Leader*. Activity 2014-133 *Leader*.	HQ

Partner #2

Institution: YARA-United States

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Brentrup, Dr Frank. <frank.brentrup@yara.com>	YARA will provide an in-kind contribution in the form of 0.5 FTE to sourcing data for model calibration and as a conduit for scaling up and out research outputs. Activity 2014-127 *Partner*.	HQ

Partner #3

Institution: University of Aberdeen-United Kingdom

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Hillier, Jonathon <j.hillier@abdn.ac.uk>	Calibration, application, and validation of models; revision of Stefest-Bouwman model; provision of links to IPCC and international organizations (such as the Cool Farm Alliance) for scaling up, implementation of models into the DSS tool. Activity 2014-128 *Partner*. Activity 2014-133 *Partner*. Activity 2014-127 *Leader*.	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	We have included a no-cost extension to the original contract with the University of Aberdeen to allow for time for YARA to complete the data curation process and to allow us to proceed with the model development work.
2016	<Not Defined>
2016	<Not Defined>

Partnerships overall over the last reporting period:

The review of global publications has involved much more time and effort than originally thought due to volume of new publications - especially from China, Europe and N. America and quality of reporting of methodology - particularly from tropics and sub-tropics. Thus the whole process has taken longer than envisaged because of the bottleneck imposed by YARA who are responsible for final quality control of data and whilst they have contributed substantially in terms of in-kind staff time this has not been sufficient to get the data in the form ready for further analysis within project deadlines.

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
Country			India
Country			Mexico

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
We will provide improved data and methods for decision makers to apply in order to support policies that reduce GHG emissions. Internationally, we will target information to the organizations in the Alliance for Climate Smart Agriculture and ensure access to improved data via the IPCC. At national/regional levels, we will interactively recommend a broad range of policies, particularly on N fertilizer subsidies. At the local level, we will work with extension actors to focus on demonstrating the economic benefits of more efficient N use. Best-bet mitigation practices with other co-benefits will be scaled up through bilateral projects, local government, NGOs and the private sector. The project consortium's links and new high impact publications will ensure recognition by international organizations such as IPCC, GRA and FAOSTAT. The outputs will be used by Fertilizer Companies (eg. Yara) as evidence to support the identification of optimal regional fertilizer application strategies and extension activities.

Annual progress towards outcome (end of 2016*): The improved model for N2O prediction is incorporated into the Cool Farm Tool and is about to be made available, due to demand, by major fertiliser companies and their partners to inform low carbon practices on farm. A high impact publication has been submitted on the improved model and this together with presentations at conferences/workshops and the project's links are ensuring growing recognition amongst international organisations (e.g. GRA, IPCC) of the potential impact of project outputs on N2O predictions.

Annual progress towards project outcome in the current reporting cycle (2016*): N-use technologies: In collaboration with the MasAgro program, we are continuing to measure economic benefits with the use of optical sensor technology in farmers' fields. Farmers are consistently saving nitrogen fertilizer without penalties for grain yield. We are also introducing the application of this tool to other crops such as barley and sorghum. In addition, through the years we have become more convinced of the importance of introducing policy, not only to help speed adoption but also to secure long term use of the technology. We are working with differ modalities in several regions (the state of Sonora, in Baja California and the State of Guanajuato) and there have been important lessons. For sensor technology to have impact with farmers we either need to develop a business model that will insure profitability and/or government policy that will provide the incentives for farmer adoption. In addition, we are making good progress in evaluating new technologies such as drones, manned airplanes and satellites for N diagnostics as complementary technologies to the ground optical sensors and to allow us to reach a larger number of farmers. N2O model: One problem with previous studies predicting N2O emissions has been the difficulty in accounting for the effect of study length and the difficulties in deriving annualised emissions factors (EF) from this. The 2017 Scientific Reports – Nature publication (in press) illustrates the benefits of employing a non-linear parametric model. The analysis concludes that for tropical and sub-tropical observed field data there is no robust reason to reject the Bouwman model (as used in the CFT) nor the IPCC 1% models. Indeed when we modelled the full subset of data for the tropics and subtropics and accounted for the effect of study length and crop types, annualised EFs across several tropical regions were close to 1%.

How communication and engagement activities have contributed to achieving your Project outcomes:* With support from the USDA office we put plans in place for a 2017 NDC assessment for Mexico. Once this report is completed and together with the recently measured EFs for wheat in Mexico, we feel that this type of information will enhanced an already close collaboration with the Mexican government particularly in the area of climate change mitigation. The modelling work has been used to inform other UK research council funded work. The University of Aberdeen is conducting a regional analysis for China with plans for embedding the model into a regionalised DST to highlight good N management practices.

Evidence documents of progress towards outcomes:*

https://marlo.cgiar.org/data/ccafs/projects//22/projectOutcome/Albatino%20et%20al.pdf

Annual progress towards outcome (end of 2015): Key stakeholders (e.g. fertiliser companies) are increasingly aware of the need and have expressed a demand for an improved model for N2O prediction based on results produced by project.

Annual progress towards outcome (end of 2017): Project outputs results in improved data and methods for decision makers to apply in order to support policies that reduce GHG emissions. Project outputs inform international organizations in the Alliance for Climate Smart Agriculture, Fertilizers Europe and the International Fertilizer Association, Sustainable Agriculture Initiative (http://www.saiplatform.org/), and access to improved data is ensured via the IPCC and the open database of N2O emissions measurements.

Annual progress towards outcome (end of 2018): Project outputs are being used to refine climate smart practices. Best-bet mitigation practices with other co-benefits are being scaled through bilateral projects (e.g. MasAgro with linkage to Mexican government's SAGARPA programme, CSISA, SIMLESA). The project consortium's links and new high impact publications will ensure recognition by international organizations such as IPCC, GRA and FAOSTAT. The outputs are also being used by Fertilizer Companies (eg. Yara) as evidence to support the identification of optimal regional fertilizer application strategies and extension activities.

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* The scale of the undertaking to systematically review the global N2O literature and extract necessary data has been far more substantial than initially thought and whilst we are confident of completing the task in 2017 and producing a high impact publication it will be difficult to generate large scale awareness and use of the new model in the wider stakeholder community within the same year.

4.2 CCAFS Outcomes

F3 (Lini) Outcome 2019: Global standards organizations and national decision-makers are planning and implementing low-emissions development initiatives that contribute to food security, using reliable, comparable quantification data and decision support tools.

Indicator #1: # of low emissions plans developed that have significant mitigation potential for 2025, i.e. will contribute to at least 5% GHG reduction or reach at least 10,000 farmers, including at least 10% women.

2019
Target value: 20
Cumulative target to date: 25
Target narrative: Project outputs have the potential to contribute massively to mitigation plans globally.They will lead to improved recommendations for N management in wheat- and maize-based systems globally but will also lend themselves to informed targets for N management in general. We will provide improved data and methods for decision makers to apply to support policies that reduce GHG emissions. Internationally, we will target information to the Alliance for Climate Smart Agriculture, Fertilizers Europe and the International Fertilizer Association, Sustainable Agriculture Initiative, and ensure access to improved data via the IPCC and the open database of fertiliser-related N2O emissions.
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 0
Cumulative target to date: 0
Target narrative: Key stakeholders (e.g. fertiliser companies) are increasingly aware of the need and have expressed a demand for an improved model for N2O prediction based on results produced by project and will be kept informed of progress through through the project consortium network.
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 5 **Cumulative target to date:** 5 **Target achieved:** 0.0 **Target narrative:** At least 5 fertiliser/supplier/grower organisations using the improved model to inform best practice for GHG mitigation in agriculture. Having been made aware of the utility of the improved N2O model for estimating GHG emissions, the model is embedded in the Cool Farm Tool and actively promoted amongst CFA member organisations. YARA will also be actively promoting the use of the model amongst its growers. **Narrative for your achieved targets, including evidence:** The final global model will be delivered in 2017 and so this target has been delayed **Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome:** We have started to deliver earlier than expected on aspects of G&SI gender with one publication accepted and another submitted. **The expected annual gender and social inclusion contribution to this CCAFS outcome:** Gender and social inclusion will be taken into consideration at a later stage when it comes to barriers to uptake and trade offs.

2017
Target value: 0 **Cumulative target to date:** 5 **Target narrative:** <Not Defined> **The expected annual gender and social inclusion contribution to this CCAFS outcome:** <Not Defined>

Major Output groups:

- F3 (Lini): Methods and data for quantifying low-emissions agriculture options appropriate to smallholder farmers

- F3 (Lini): Decision support for identifying and prioritizing low-emissions CSA options, including synergies and tradeoffs with development objectives

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
<Not Defined>

Collaborating with other CRPs

Maize
Description of collaboration: We are collaborating with both MAIZE and WHEAT on training and scaling of optical sensor technologies to improve N management in Mexico.

Wheat
Description of collaboration: See above

4.4 Case Studies

Case Study #91

Title: Mexican government provides support for scaling out technologies for better N management.

Year: 2016

Project(s): P22

Outcome Statement: Informed by a robust evidence base on the utility of optical sensor-based technology, the Mexican government is support the training of extension staff and farmers to scale the use of optical sensor N technologies and best practices in several regions of Mexico resulting in consistent savings in N fertiliser use without any yield penalty. With USDA funding, we will explore how this work can help inform NDC in 2017.

Research Outputs: Millar, N., Kahmark, K., Urrea, A., Robertson, P. and Ortiz-Monasterio, I. (2017) Nitrous oxide response to nitrogen fertilizer in irrigated spring wheat in the Yaqui Valley, Mexico. Agriculture, Ecosystems and Environment. (In Press). Ortiz-Monasterio, I., U. Schulthess, B. Govaerts and C. Dobler . "From GreenSeeker to GreenSat." Modernización Sustentable de la Agricultura Tradicional MasAgro (CIMMYT) presentation. Available at: http://www.slideshare.net/CIMMYT/from-greenseeker-to-greensat.Accessed on May 3, 2015. Written inputs to the Membership of the Mexican group lead by the Colegio de Postgraduados (COLPOS) that is looking to develop emissions factors for wheat and maize across different locations in Mexico. Series of workshop and training reports in Spanish.

Research Partners: Dr Phil Roberston, Kellogg Biological Station, Michigan State University Department of Plant, Soil and Microbial Sciences, Michigan State University. Colegio de Postgraduados en Ciencias Agricolas. Texcoco

Activities: CIMMYT and partners have adapted the GreenSeeker for use under Mexican conditions thereby allowing farmers in the three major wheat producing regions of Mexico (Southern Sonora, Mexicali Valley and El Bajio), which together cover 75% of the 666,000 hectares of wheat production in Mexico) to reduce N2O emissions by at least 25%, while maintaining grain yield. In the State of Guanajuato, the state government has supported a network of farm advisers to scale out the optical sensor This technology has been successfully transferred to farmers under different government programs. In addition, we have successfully transferred this technology to farmers growing barley and maize showing similar reductions in N2O emissions.

Non-Research Partneres: Key partners include farmers organisations, extension staff and Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food Supply (SAGARPA – Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación).

Output Users: State farm advisors and cooperatives in states of Sonora and Guanajuato and private farm advisers Baja, California

Evidence Outcome: Letters and email between CIMMYT and SARGAPA that show links between the research of CIMMYT and Government support for scaling of the N technologies.

Output Used: In the state of Sonora we have been working with farm advisers that belong to the farmers cooperatives. In Baja California we worked with private farm advisers and have provided funding to them for three years so that they become familiar with the technology.

References Case: Series of training and workshop reports in Spanish (example uploaded).

Primary 2019 outcome indicator(s):

- # millions of hectares targeted by research-informed initiatives for scaling up low-emissions agriculture and preventing deforestation
- # of low emissions plans developed that have significant mitigation potential for 2025, i.e. will contribute to at least 5% GHG reduction or reach at least 10,000 farmers, including at least 10% women.

Link between outcome story and and the FP Outcome(s): <Not Defined>

Annex uploaded: https://marlo.cgiar.org/data/ccafs/projects//22/caseStudy/Julio%202016.rar

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019
F3 (Lini): Methods and data for quantifying low-emissions agriculture options appropriate to smallholder farmers **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F3 (Lini): Decision support for identifying and prioritizing low-emissions CSA options, including synergies and tradeoffs with development objectives **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>

Major Output groups - 2016
F3 (Lini): Methods and data for quantifying low-emissions agriculture options appropriate to smallholder farmers **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** - Significant contribution to setting minimum data standards for field based N2O studies. - On-demand open access to unique, quality controlled global database on N2O emissions - New model describing global emissions of N2O from agricultural soils. **Brief summary of your actual 2016 contribution towards the selected MOG:** We have substantially contributed to all three MOGs with a gold standard database and template that is available on request and from GRAMP website (template only). We have also developed a new model based on the tropical dataset in preparation for the new global model to be delivered in 2017. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** Insufficient funds to address this. **Summary of the gender and social inclusion dimension of the 2016 outputs:** With additional funds available from FP3 to support a gender consultant we produced a new article that has been accepted for publication in the International Journal of Agricultural Sustainability entitled 'Gender and inorganic nitrogen: what are the implications of moving towards a more balanced use of fertiliser in the tropics?'

F3 (Lini): Decision support for identifying and prioritizing low-emissions CSA options, including synergies and tradeoffs with development objectives

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: - raising awareness with the production of an high impact publication on new N2O emissions model - greater confidence that the analysis of mitigation-interventions especially in the tropics are directionally correct. - Use of benchmark, good quality datasets for model calibration and comparison.

Brief summary of your actual 2016 contribution towards the selected MOG: We have made substantial progress against all three MOGs with a new open access article accepted for publication in Scientific Reports Nature; a comprehensive N2O database and an analysis of farm survey data in the IGP to evaluate the management and socio-economic variables contributing to low-emissions and high yields.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Insufficient funds to address this.

Summary of the gender and social inclusion dimension of the 2016 outputs: Using the large farm survey data we have include gender as a component of the analysis of low emission development pathways in the IGP.

Major Output groups - 2015

F3 (Lini): Methods and data for quantifying low-emissions agriculture options appropriate to smallholder farmers

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Comprehensive analysis of tropical and sub-tropical dataset indicate (i) differences in N2O emissions factors between fertiliser types and regions and (ii) that the use of the current IPCC default EF or such tools as the EXACT and Cool Farm Tools for tropics and subtropics are within the acceptable range.

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Not applicable

F3 (Lini): Decision support for identifying and prioritizing low-emissions CSA options, including synergies and tradeoffs with development objectives

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Our studies in India indicate that there is the potential for substantial GHG savings by targeting cereal producers with NUE 25%, of which there are many. The global analysis (to be completed in 2016) will support more robust identification of regional effects and region-specific optimisation of N use.

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Preparation of paper on implications for gender of improved nitrogen use in high and low N fertiliser systems.

Major Output groups - 2014

F3 (Lini): Methods and data for quantifying low-emissions agriculture options appropriate to smallholder farmers

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F3 (Lini): Decision support for identifying and prioritizing low-emissions CSA options, including synergies and tradeoffs with development objectives

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D266 - Analysis and publication submitted on tropical N2O dataset.

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2015

New expected year: 2016

Cross-cutting dimension:

- N/A

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: DIRECT NITROUS OXIDE EMISSIONS FROM TROPICAL AND SUB-TROPICAL AGRICULTURAL SYSTEMS - A REVIEW AND MODELLING OF EMISSION FACTORS
Description / Abstract: There has been much debate about the uncertainties associated with the estimation of direct and indirect agricultural nitrous oxide (N2O) emissions in developing countries and in particular from tropical regions. In this study, we report an up-to-date review of the information published in peer-review journals on direct N2O emissions from agricultural systems in tropical and sub-tropical regions. We statistically analyze net-N2O-N emissions to estimate tropic-specific annual N2O emission factors (N2O-EFs) using a Generalized Additive Mixing Model (GAMM) which allowed the effects of multiple parameters to be modelled in a semi-parametric manner based on data-driven smooth continuous functions. Overall the mean N2O-EF was 1.2% for the tropics and sub-tropics, thus within the uncertainty range of IPCC-EF. On a regional basis, mean N2O-EFs were 1.4% for Africa, 1.1%, for Asia, 0.9% for Australia and 1.3% for Central & South America. Our annual N2O-EFs, estimated for a range of fertiliser rates on the available data, do not support recent studies hypothesising non-linear increase N2O-EFs as a function of applied N. This finding highlights that in reporting annual N2O emissions, and estimating N2O-EFs, particular attention should be paid in modelling the response of N2O across the length of the studies.
Publication / Creation date: Still in draft
Language: english
Country: United Kingdom
Keywords: nitrous oxide emissions, fertiliser, tropical, model
Citation: Albanito, F., Lebender, U., Cornulier, T., Sapkota, T., Brentrup, F., Stirling, C., and Hillier, J. (2017). Direct nitrous oxide emissions from tropical and sub-tropical agricultural systems - a review and modelling of emissions factors. Scientific Report Nature (In Press).
Handle: <Not Defined>

DOI: <Not Defined>
Creator / Authors: <Not Defined>

Publication Metadata

Volume:
Issue:
Pages:
Journal/Publisher name:
Indicators for journal articles: ● This journal article is an ISI publication
● This article have a co-author based in an Earth System Science-related academic department
Publication acknowledge: Yes
Flagships contribution:

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Stirling, Clare <c.stirling@cgiar.org>	Responsible
University of Aberdeen	Hillier, Jonathon<j.hillier@abdn.ac.uk>	Other
YARA	Brentrup, Dr Frank.<frank.brentrup@yara.com>	Other

D267 - Tropical N2O model contributing to the global model that will inform DSTs (e.g. CFT, MOT).

Main Information

Type: Data, models and tools

Subtype: Data portal/Tool/Model code/Computer software

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- N/A

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Dataverse (Harvard)

Dissemination URL: http://gramp.org.uk/emissions/

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: GRAMP: Template for entering field emissions data

Description / Abstract: We (YARA, University of Aberdeen and CIMMYT) have developed a template for entering field data on nitrous oxide emissions whilst capturing associated climate, soil and crop conditions that are likely to strongly influence rates of emissions. This template has been uploaded on the GRAMP website. We also have an excel version of the template that has been populated with data extracted from publications working, our way through the different global regions: Overall we found approx. 1144 publication on N2O After a first check we excluded studies based on process modelling, lab, greenhouse experiments, and review articles and selected approx. 637 studies across the globe Total number papers analysed for: Tropics and sub-tropics = 46 Europe = 84 China = 105 USA and 'rest of the world' is similar in number to those from Europe. The database is openly available on request.

Publication / Creation date: 2016-01-01

Language: English

Country: UK

Keywords: Data, nitrous oxide emissions, fertiliser, climate, soils

Citation: Albanito, F., Lebender, U., Cornulier, T., Sapkota, T., Brentrup, F., Stirling, C., and Hillier, J (2017). DIRECT NITROUS OXIDE EMISSIONS FROM TROPICAL AND SUB-TROPICAL AGRICULTURAL SYSTEMS - A REVIEW AND MODELLING OF EMISSION FACTORS. Scientific Reports Nature (In Press)

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
University of Aberdeen-United Kingdom	Hillier, Jonathon <j.hillier@abdn.ac.uk>	Responsible
YARA	Brentrup, Dr Frank.<frank.brentrup@yara.com>	Other

D268 - At least two publications including a high impact publication on the new tropical N2O model.

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- N/A

Deliverable dissemination

Is this deliverable already disseminated: No

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: DIRECT NITROUS OXIDE EMISSIONS FROM TROPICAL AND SUB-TROPICAL AGRICULTURAL SYSTEMS - A REVIEW AND MODELLING OF EMISSION FACTORS

Description / Abstract: There has been much debate about the uncertainties associated with the estimation of direct and indirect agricultural nitrous oxide (N2O) emissions in developing countries and in particular from tropical regions. In this study, we report an up-to-date review of the information published in peer-review journals on direct N2O emissions from agricultural systems in tropical and sub-tropical regions. We statistically analyze net-N2O-N emissions to estimate tropic-specific annual N2O emission factors (N2O-EFs) using a Generalized Additive Mixing Model (GAMM) which allowed the effects of multiple parameters to be modelled in a semi-parametric manner based on data-driven smooth continuous functions. Overall the mean N2O-EF was 1.2% for the tropics and sub-tropics, thus within the uncertainty range of IPCC-EF. On a regional basis, mean N2O-EFs were 1.4% for Africa, 1.1%, for Asia, 0.9% for Australia and 1.3% for Central & South America. Our annual N2O-EFs, estimated for a range of fertiliser rates on the available data, do not support recent studies hypothesising non-linear increase N2O-EFs as a function of applied N. This finding highlights that in reporting annual N2O emissions, and estimating N2O-EFs, particular attention should be paid in modelling the response of N2O across the length of the studies.

Publication / Creation date: 2017-03-01

Language: English

Country: UK

Keywords: <Not Defined>

Citation: Albanito, F., Lebender, U., Cornulier, T., Sapkota, T., Brentrup, F., Stirling, C. and Hillier, J. (2017) DIRECT NITROUS OXIDE EMISSIONS FROM TROPICAL AND SUB-TROPICAL AGRICULTURAL SYSTEMS - A REVIEW AND MODELLING OF EMISSION FACTORS. Nature Scientific Reports. In Press

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Publication Metadata

Volume: In Press
Issue:
Pages:
Journal/Publisher name: Nature Scientific Reports
Indicators for journal articles: ● This journal article is an ISI publication
● This article have a co-author based in an Earth System Science-related academic department
Publication acknowledge: Yes
Flagships contribution: ● CCAFS - F3 (LINI)

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//22/deliverableDataSharing/112079_1_merged_1477487799.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Stirling, Clare <c.stirling@cgiar.org>	Responsible
University of Aberdeen	Hillier, Jonathon<j.hillier@abdn.ac.uk>	Other
YARA	Brentrup, Dr Frank.<frank.brentrup@yara.com>	Other

5.3 Project Highlights

Project highlight 141	
Title: Identifying high-yield, low-emission development pathways for the cereal systems of the Indo-Gangetic Plains, India.	
Author: Tek Sapkota and Clare Stirling	**Subject:** Biophysical, socioeconomic, greenhouse gas emissions, cereals
Publisher: CIMMYT	**Year reported:** 2016
Project highlights types: ● Breakthrough science	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Greenhouse gas emissions, low emissions development pathways, cereals, India	**Countries:** India

Highlight description: This study makes some important policy recommendations in the context of climate change, agriculture and food security in the Indo-Gangetic plains of India, a region that represents a major breadbasket. India has recently declared a voluntary goal of reducing the emissions intensity of its GDP by 20-25% over the 2005 level by 2020 and has placed emphasis on land-based mitigation measures. As the third largest global emitter, such a commitment is significant in terms of potential impacts on climate forcing. Agriculture is the second largest source of GHG emission in India accounting for 18% of the gross national emission. With a population of >1.3 billion and increasing, GHG emission from agriculture production in India are expected to increase further. Therefore, development and promotion of high-yield low-emission production systems is not a choice but a necessity. Here, we estimated GHG emissions from rice, wheat and maize production in Haryana and Bihar states of India based on farm survey data. The different management options contributing to emissions reduction and the various socio-economic factors that determine the choice of appropriate management options were explored. Using this information, a "yield-emission' framework was developed and proposed to identify target 'high-yield low-emission' pathways. Based on this analysis, various policy implications were discussed in the context of climate change and food security. It is hoped that this type of analyses helps inform agricultural development policies that are consistent with food security, environmental and economic development priorities.

Introduction / Objectives: Quantification of GHG fluxes between agricultural field and the atmosphere is essential for understanding the contribution of various management practices on the emission and to develop mitigation options and policies, raise awareness and encourage adoption of technologies and practices accordingly. Further, the yield improvement and emission reduction in any type of agriculture production system is directly influenced by farmers' decision to use water, nutrient, energy and management related technologies and practices. In this study, we identified various technological and farm management practices that influence GHG emissions and explored different household socioeconomic conditions associated with the adoption of high-yielding low-emitting technologies.

Results: This study demonstrated an inverse relation between grain yield and emission intensity for all three crops (rice, wheat and maize).Data confirmed the strong and positive influence of N fertilizer on both crop yield and GHG emission. Using farm survey data we determined the optimum N rate that coincided with the highest grain yield and lowest GHG emission intensity for all three crops and for

the high-input production zone (Karnal, Haryana) and low-input production zone (Vaishali, Bihar). Results show that ca. 85% farmers in Karnal and 30% farmers in Vaishali reported application rates greater than the optimum rate of N in rice and wheat. This shows huge opportunities to reduce GHG emissions whilst maintaining grain yield by reducing N rate and adopting best fertilizer management practices to increase nutrient-use efficiency. The results also caution that if intensification of agriculture in Bihar follows a similar pathway to that of Haryana where rates of fertilizer use are supra-optimal, then targets for reductions in GHG emissions will be even more difficult to achieve in India. In terms of low emissions development pathways, overall we found that lower yield-scaled emissions were associated with: • literate household heads, larger plot size and ownership of a thresher implying that richer and more educated farmers intensify with increased input-use efficiency • access to information from private seed companies suggesting that use of high-yielding maize varieties with high inputs to increase the yield is a means of reducing emissions intensity. • training on climate change, seed and cropping systems management • male-headed households and level of literacy of the spouse Our findings add to the understanding of social drivers such as education and access to information contributing to climate change, particularly in relation to GHG emissions from agriculture.

Partners: CCAFS South Asia Regional program

Links / Sources for further information: Article submitted to journal and will be made available when published

6. Activities

A127 - Open database and improved practical method to predict N2O emissions.

Description: We will establish an open resource of N2O emissions measurements from agricultural soils as a function of agricultural management and soil and climate conditions. The database will be made available to the wider community to allow practitioners to input and make use of new experimental data as it emerges. The database will form the basis for a revision of the Stehfest and Bouwman 2006 models. As well as a simple revision we will also explore options to add further granularity and responsiveness to the model, among which are an exploration of the capacity to include an N-balance (in preference to N-rate) as an explanatory variable, and the possibility of developing distinct regional models to replace the global one or Stehfest and Bouwman.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: University of Aberdeen-United Kingdom Hillier, Jonathon <j.hillier@abdn.ac.uk>
Status: On-going

Overall activity or progress made during this cycle: A detailed review was undertaken of the literature published in peer-review journals on studies based on agricultural land with in situ measurements of N2O. The Web search was complemented with a search through the literature cited in the articles found as well as the study of Stehfest and Bouwman (2006). The data extracted contained key information of the experimental sites. We analysed N2O emission using a GAMM model from tropical and sub-tropical countries included 48 scientific publications spread across four continents and 14 countries. The database has since been extended to include data extracted from other global regions including Europe, USA and China with the plan to complete all regions in 2017.

Deliverables in this activity:

- D262: Open access database of N2O emissions from agricultural soils will be made available on request.
- D266: Analysis and publication submitted on tropical N2O dataset.

A128 - Improved N2O emissions data from wheat-/maize-based systems through generation of in-country data.

Description: Nitrous oxide emissions will be quantified in a series of field trials established for wheat- and maize-based systems in Mexico and India. The mitigation potential of efficient N management practices will be quantified, with treatments including: (1) In Mexico, sensor-based N management, nitrification inhibitors and slow release sources of N in irrigated wheat-based and rainfed maize systems. (2) In India, precision nutrient management on GHG emissions in irrigated rice-wheat, rice-maize and maize-wheat based systems.

Start date: Jan 2015 **End date:** Jan 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Stirling, Clare <c.stirling@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Mexico: The wheat experiment looking at different N managements was established in NW Mexico and the soil and gas samples were collected and currently data are being analysed. Crop performance data was also collected. The maize experiment looking at increasing rates of N was establish successfully in the Central highlands and all the soil and gas samples were collected as planned. India: Two field trials (one in rice-wheat system in Karnal and another in maize-wheat system in Pusa) were established to study N2O emission as a function of N fertilization rate and methods of application. The main objectives of these trials were to evaluate the N2O mitigation potential of efficient N management practices (rate and method of application) in rice-wheat and maize-wheat system. We have N2O emission database from two cropping systems under different rate and methods of N fertilization and are currently analysing these data.

Deliverables in this activity:

- D260: Analysis of plot-level N2O emission mitigation strategies in maize- and wheat-based cropping systems.

A133 - Recommendations for the most applicable modelling approaches to determine best-bet N2O mitigation strategies.

Description: A parallel work stream to Activity #2 will be to calibrate, evaluate and improve one or more process-based (e.g. DSSAT/DAYCENT, APSIM) models for GHG emissions from maize/wheat-based systems and then cross- compare with the new empirical model and site data generated from Activity #2. The principle aim of the work stream will be to determine how the suitability of different types of models depend on the spatial scale modelled e.g. at which point is there sufficient added value to adopt a process-based model over the improved empirical one (developed under Activity #1). We will engage with key partners and policy makers to (i) evaluate how process-based models may be used in such a way as to make the outputs immediately useable by decision makers and (ii) to prioritise and invest in productive and adaptive practices with N2O mitigation co-benefits in maize and wheat-based system.

Start date: Jan 2017 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Stirling, Clare <c.stirling@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: The major part of this activity will begin once analysis of the data from the field trials is completed and ready to be used for model calibration. Initial efforts will focus on calibrating the DSSAT models at our sites followed by some 'virtual' modelling experiments at the site level.

Deliverables in this activity:

<Not defined>

A395 - BILATERAL - Scaling of climate smart practices that reduce GHG emissions.

Description: Best-bet mitigation practices with other co-benefits will be scaled up through CCAFS FP1.1 climate smart villages and bilateral projects (e.g. MasAgro, USDA-EC LEDS project in Mexico and its contacts; CSISA; SIMLESA). Local government, NGOs and the private sector will implement best-bet mitigation practices, including efficient N management recommendations from the project. An example of how these bilateral projects are supporting and contributing to the CCAFS Project on Global N emissions is described below for the bilateral component in Mexico.

Start date: Jan 2015 **End date:** Jan 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Stirling, Clare <c.stirling@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: We have developed and continue to strengthen an international alliance among several institutions to address mitigation practices for wheat and maize. In Mexico there are three international institutions: CIMMYT-CCAFS, USDA- EC LEDS and KBS - MSU. On the Mexican side the following institutions are participating; Colegio de Postgraduados (COLOPOS), Instituto Nacional de Investigaciones forestales, Agricolas y Pecuarias (INIFAP), Universidad Autonoma de Baja California (UABC), and CIMMYT as a network of scientists collecting N2O data for maize a wheat in several regions of Mexico. CONCAYT has also provided some funding to support field measurements. During 2015 USDA- EC LEDS and KBS-MSU joined efforts to provide technical support for the network of Mexican scientists as a result of that a workshop was organized by USDA – EC LEDS, KBS – MSU and CCAFS- CIMMYT to provide training on N2O data collection and data management and these activities continued in 2016.

Deliverables in this activity:

<Not defined>

7. Leverages

No leverages added

Title: Developing, adapting and targeting portfolios of CSA practices for sustainable intensification of smallholder and vulnerable farming systems in South Asia

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2018	RP SAs	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>

Funding source types	Status	Lead Organization	Project leader
W1/W2, Bilateral	On-going	CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo - Mexico	Jat, ML <m.jat@cgiar.org>

Project is working on

Flaship(s)
F2 (before F1 - Andy): Climate-Smart Technologies and Practices

Region(s)
SAs: South Asia

Project summary

CSAPs developed & validated under CCAFS and related projects have demonstrated improved productivity, resilience and adaptive capacity across agro-ecologies. However, the response and adoption of CSAPs varies with bio-physical and socio-economic diversity of farm households. The lack of integration of bio-physical and socio-economic knowledge in technology targeting limits adoption by diversity of farmers. Therefore, development and targeting portfolios of CSAPs within CSVs requires in-depth understanding of the diversity of farming practices on the adaptive capacity and food security. Evidence of CSAPs will be used for developing recommendation domains of CSAPs integrating diversity of bio-physical, socio-economic and political factors. Recommendation domains of potentially adoptable and gender responsive CSAPs will be validated employing key indicators (food security, economics, adaptive capacity, gender and social equity, mitigation). Analogues of potential CSAPs will be developed for scaling CSVs using evidence and linking outputs with related CCAFS Flagships, bilateral projects and national initiatives.

2. Partners

Partner #1 (Leader)

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Jat, ML <m.jat@cgiar.org>	Activity 2014-251 *Leader*.	New Delhi, India
Partner	Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>	Activity 2014-252 *Leader*.	New Delhi, India
Partner	Mittal, Surabhi <s.mittal@cgiar.org>	Activity 2014-253 *Leader*.	New Delhi, India

Partner #2

Institution: IRRI - International Rice Research Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Lada, J K <j.k.ladha@irri.org>	Contributing to the development of (a) CSAPs related to rice based systems, (b) database/information system for development of typologies and recommendation domains, and (c) cross cutting activities including gender, monitoring and evaluations, and capacity strengthening. Major responsibilities include the implementation of the CSAPs portfolios and pilot CSVs in Odisha in India and Khulna in Bangladesh in collaboration with other partners, and contribute to the other locations. Activity 2014-251 *Partner*. Activity 2014-252 *Partner*. Activity 2014-253 *Partner*.	HQ

Partner #3

Institution: ICAR - Indian Council of Agricultural Research

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Alagusundaram, K <ddgnrm@icar.org.in>	Contribute to the databases, information and capacity for the development of CSAPs portfolios, validation of CSAPs portfolios for diversity of farming systems within CSV sites (CCAFS and NICRA) across India. Facilitate stakeholder consultation and partnerships with NARES (ICAR Institutes, State Agriculture Universities, State Department of Agriculture) and leveraging resources through linking projects related to climate smart agriculture in India. Activity 2014-251 *Partner*. Activity 2014-252 *Partner*. Activity 2014-253 *Partner*.	HQ

Partner #4

Institution: BARC - Bangladesh Agricultural Research Council

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Director, Executive <dir-aic@barc.gov.bd>	Activity 2014-253 *Partner*.	HQ

Partner #5

Institution: WUR - Wageningen University and Research Centre

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Groot, Annemarie <annemarie.groot@wur.nl>	Contribute to Business model activity	HQ

Partner #6

Institution: BISA - Borlaug Institute for South Asia

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Kumar Jat, Dr. Raj <r.jat@cgiar.org>	Project activities in Bihar	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	Fund cuts resulted in IFPRI moving out of the project, and we could not achieve the deliverable assigned to them. For the coming planning 2017, the link of the deliverable remains missing which is required to be filled through other partners meeting the project outcome.
2016	Fund cuts resulted in IFPRI moving out of the project, and we could not achieve the deliverable assigned to them. For the coming planning 2017, the link of the deliverable remains missing which is required to be filled through other partners meeting the project outcome.

Partnerships overall over the last reporting period:

Integrated approach towards outcome was targeted by all the partners in the project. Collaborating the expertise and skill with the vested mutual interest have played significant role in accomplishing the deliverables on time meeting the standard criterias. With domain strength, IRRI provided its support in intervention activities in Bangladesh, with support from BARC. WUR have provided business aspect to the existing platform with establishing links among different sectors. ICAR has been the nodal institute providing support at project sites extending scientific and administrative support. Field operations and research is done in very close collaboration with BISA

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
Country			Bangladesh
Country			India
Province	0.0	0.0	Punjab
District	0.0	0.0	Ludhiana
Province	0.0	0.0	Haryana
District	0.0	0.0	Karnal
Province	0.0	0.0	Bihar
District	0.0	0.0	Vaishali
District	0.0	0.0	Samastipur
Province	0.0	0.0	Odisha
District	0.0	0.0	Puri
District	0.0	0.0	Bhadrak
Province	0.0	0.0	Karnataka

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
The key objectives of project are to (a) develop and mainstream a framework fully validated for CSAP portfolios across diversity of farming system typologies, and (b) implement portfolios of targeted multi-commodity focused CSAPs through Climate Smart Villages. With increased capacity, attitude and skills of > 100 key decision-makers through generation, targeting and dissemination of evidence based knowledge of CSAP portfolios, the project will assist 0.5 million smallholder and low income men and women farmers in targeted regions to increase the productivity of irrigated and rainfed farming systems by 15% while reducing costs by 20% and environmental footprints by 10%.

Annual progress towards outcome (end of 2016*): The CSAPs are further mainstreamed and at least one additional sub-national government is using CCAFS-informed approaches and the Climate-Smart Village concept for upscaling CSAPs to additional 100 villages. At least 1 additional success stories of the CSA practices (involving marginalized and women farmers) from evidences in CSVs are documented which have large potential for scaling-out by the local and national Governments

Annual progress towards project outcome in the current reporting cycle (2016*): During 2016, additional evidence (high impact publication, reports, database) on multi-commodity portfolio of CSAPs generated from the CSVs helped in creating awareness of CSA among the stakeholders specially policy planners using social media, success stories and case studies. Accordingly, the Government of Bihar have taken a decision for scaling CSA and CSVs across all the districts of Bihar which has been reported as an outcome case study. Additionally, first hard evidence (high impact publication) on how Conservation Agriculture based management practices helps in adapting wheat to climate risks was documented which created policy level awareness and facilitating mainstreaming of CA as climate smart agriculture practice. The development champions have been identified for scaling CSAPs targeting some specific technologies which needs immediate action with expected large impact, for example happy seeder technology for eliminating residue burning in Haryana and Punjab. Capacity of large number of women and men stakeholders enhanced though large number of events.
How communication and engagement activities have contributed to achieving your Project outcomes:* Participatory research to generate science backed evidence on CSAPs from CSV Pilots in Samastipur and Vaishali districts of Bihar Stakeholder consultation led by Agriculture Production Commissioner of Bihar was organized for mainstreaming of CSAPs in the "Innovative Agricultural Road-Map" of Bihar. Capacity development of stakeholders through travelling seminars, training workshops and field days for knowledge dissemination about CSAPs involving participation from the government. High level policy leaders (Chief Minister, Agriculture Minister and senior officials of Government of Bihar) visits the CCAFS pilot sites at Samastipur and Vaishali and had insights of CSAPs and CSVs from the farmers and other stakeholders.
Evidence documents of progress towards outcomes:* https://marlo.cgiar.org/data/ccafs/projects//25/projectOutcome/Bihar%20letters.pdf

Annual progress towards outcome (end of 2015): Through CCAFS enabled evidences and enhanced capacity of development organizations, the CSAPs are mainstreamed and at least one State government in India is using CCAFS-informed policy approaches and the Climate-Smart Village concept for upscaling climate-smart practices to more than 400 villages. At least two success stories of the CSA practices (involving marginalized and women farmers) from evidences in CSVs are documented which have large potential for scaling-out by the local and national Governments. "FOR REPORTING IN AUG 2015: "At least one Indian State government is using CCAFS-informed approaches and the Climate-Smart Village concept for upscaling climate-smart practices to more than 400 villages"

Annual progress towards outcome (end of 2017): To be defined in CCAFS phase-II

Annual progress towards outcome (end of 2018): To be defined in CCAFS Phase-II

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* Stakeholder engagement (participatory) at all the stages of technology development and refinement helps in buy-in by the policy planners and early uptake of the technologies by the farmers. In the event of climate risks, documenting and showcasing the role of the CSA technologies/interventions as double wins, helps in better understanding of the stakeholders for prioritizing those interventions not only as best bet in normal weather conditions but also as best adapted technologies in the event of climatic risks for example we captured and showcased the role of conservation agriculture not only as resource conserving practice but also reducing risks of untimely excess rains and how that affects the overall food security. These strategies helps in policy level buy-in of the technologies and prioritizing investments.

4.2 CCAFS Outcomes

RP SAs Outcome 2019: Governments, private sector and farmer organizations increase their investments and develop incentive mechanisms to promote wide scale adoption of improved climate-smart practices and technologies

Indicator #1: # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

2019
Target value: 2 **Cumulative target to date:** 4 **Target narrative:** At least 2 initiative would lead to 500000 farmers adopting CCAFS informed CSAPs which are helping them to increase food production with 15% less cost and better adaptation to climatic risks **The expected annual gender and social inclusion contribution to this CCAFS outcome:** <Not Defined>

2015
Target value: 1 **Cumulative target to date:** 1 **Target narrative:** At least 1 initiative would lead to 200000 farmers adopting CCAFS informed CSAPs which are helping them to increase food production with 15% less cost and better adaptation to climatic risks **The expected annual gender and social inclusion contribution to this CCAFS outcome:** <Not Defined>

2016
Target value: 1
Cumulative target to date: 2
Target achieved: 1.0
Target narrative: At least 1 initiative would lead to 200000 farmers adopting CCAFS informed CSAPs which are helping them to increase food production with 15% less cost and better adaptation to climatic risks
Narrative for your achieved targets, including evidence: Mainstreaming of Climate smart agriculture and Climate smart villages by govt. of Bihar will help to adopt large number of smallholder farmers by 2019.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: There have gender specific interventions made for the adoption of climate smart agriculture technologies by the women. This mainly focused on their decision making and access& control over resources for better household livelihood. Socio-economic parameters were analysed for a well structured capacity building of the women and marginalised groups for their inclusion in climate smart villages scaling project.
The expected annual gender and social inclusion contribution to this CCAFS outcome: The project will developed robust gender-responsive framework for targeting and implementing CSAPs within CSVs for increased adoption. The project will involve participation of atleast 40% women and other socially-differentiated groups in project activities through specific targeting, gender-responsive capacity building and demonstrations of the CSAP portfolios. Provision of support for implementing participatory gender-responsive methodologies with farming households to promote gender-sensitive planning in relation to the selected CSAP portfolios.

Major Output groups:

● F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

● F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
The evidence for CSAPs generated under FP 1 are being shared with FP 4.1 to catalyse the policy planners for prioritization investments on scaling CSAPs as a risk management strategies in view of the recent climate related risks.

Collaborating with other CRPs

Wheat
Description of collaboration: The Sustainable Intensification Flagship of WHEAT CRP and CCAFS FP 1 (now FP 2) activities are co-developed in a participatory mode at some of the locations. The SI interventions developed are further validated from the lenses of CSA through documenting mitigation co-benefits of these SI interventions across ecologies.

Rice
Description of collaboration: The resource use efficient technologies for rice based systems under Rice Agri-food systems CRP being developed and evaluated at Odisha (India) and Bangladesh sites (managed by IRRI) are aligned with CCAFS activities. The sites are are used as joint learning platforms for impact at scale through synergies

4.4 Case Studies

Case Study #76

Title: Scaling of Climate Smart Villages across 38 districts of Bihar

Year: 2016

Project(s): P53

Outcome Statement: With CCAFS informed science backed evidence, knowledge, enhanced capacity and improved climate literacy of key decision makers, the climate smart agriculture practices have been mainstreamed in the Government of Bihar's investment and agricultural development plan targeting climate smart villages (CSVs) to be implemented across all 38 districts helping several hundreds of thousands small holder men and women farmers to improve their food, nutrition and livelihoods while coping with climate risks.

Research Outputs: Evidence on climate smart agriculture practices and Climate-Smart Villages in CCAFS's pilot sites implemented by CIMMYT-BISA and partners. (Report uploaded) https://www.dropbox.com/s/3slu4ngpnvy86zx/CSVs%20in%20Bihar_ML.pdf?dl=0 https://ccafs.cgiar.org/publications/climate-change-adaptation-greenhouse-gas-mitigation-and-economic-profitability#.WKaIJOSB-Uk http://dx.doi.org/10.1016/j.fcr.2014.04.015 http://onlinelibrary.wiley.com/doi/10.1111/sum.12331/pdf http://www.sciencedirect.com/science/article/pii/S0065211315300055 https://ccafs.cgiar.org/publications/economic-benefits-climate-smart-agricultural-practices-smallholder-farmers-indo#.WKaY8uSB-Uk Governance, guidance, LAPA : https://www.dropbox.com/s/x0rufzjc4afd9k6/LAPA-Climate%20Smart%20Villages_28-08-2015.pdf?dl=0 (File Uploaded) Development and assessment of portfolio of CSA interventions in Climate-Smart Villages : http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=26-27 http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=35-36 Increased awareness and capacity of local govt officers and other stakeholders to design and implement Climate-Smart Villages in Bihar. https://www.dropbox.com/s/4wu9rghjxzsx722/CCAFS%20trainings%20database.xlsx?dl=0 Policy decision for scaling climate smart agriculture in Bihar: Based on series of consultations, capacity development and sharing evidence, the Bihar Agricultural Management & Training Institute (BAMETI), Government of Bihar have taken decision to implement climate smart agriculture and CSVs in all 38 districts of Bihar. http://www.cimmyt.org/wp-content/uploads/2017/01/letter-1_bihar-story.pdf. Farmers testimonials and CSAPS videos

Research Partners: Key research partners includes national agricultural research system [Indian Council of Agricultural Research (ICAR), State Agriculture Universities], Borlaug Institute for South Asia (BISA), Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Bayer Crop Science, and CGIAR centers.

Activities: Participatory research to generate science backed evidence on Climate Smart Agricultural Practices (CSAPs) from Climate Smart Village Pilots in Samastipur and Vaishali districts of Bihar Sharing the evidence on CSAPs through presentations in high level meetings and workshops. A stakeholder consultation led by Agriculture Production Commissioner of Bihar was organized for mainstreaming of CSAPs in the "Innovative Agricultural Road-Map" of Bihar. Capacity development of stakeholders through travelling seminars, training workshops and field days for knowledge dissemination about CSAPs involving participation from the government. High level policy leaders (Chief Minister, Agriculture Minister and senior officials of Government of Bihar) visits the CCAFS pilot sites at Samastipur and Vaishali Districts and had insights of CSAPs and CSVs from the farmers and other stakeholders. http://www.cimmyt.org/participatory-scaling-of-climate-smart-agriculture/ Strategic blending of people, policy and productivity for a sustainable future has been embedded in the work-plan of Govt of Bihar, addressing and scaling climate smart agriculture.

Non-Research Partneres: Department of Agriculture, Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Farmer cooperatives, service providers and private sector (machine manufacturers, seed companies). CIMMYT-BISA linkages with the leading NGOs in the region are planned for targeting the women engaged in agriculture. Capitalizing on their women groups and disseminating CSA knowledge is intended to achieve gender equity in agriculture.

Output Users: Department of Agriculture, Ministry of Agriculture and Ministry of Environment, Government of Bihar for implementation of their policies. Research organizations like ICAR, State Agriculture Universities, Wheat and Rice Agri-food system CRPs, to expand their scope. KVKs, NGOs, CSOs, farmer cooperatives, service providers, women groups for improved knowledge and capacity.

Evidence Outcome: Chief minister of Bihar presented letter to DG CIMMYT on CIMMYT 50 event emphasizing work to address climate change challenges http://www.cimmyt.org/wp-content/uploads/2017/01/Letter-2_Bihar-story.pdf. BAMETI, Govt of Bihar issued letter to CIMMYT-CCAFS, stating plan to implement CSAPs. http://www.cimmyt.org/wp-content/uploads/2017/01/letter-1_bihar-story.pdf. Bihar Krishi Road map and Chief ministers visit to Pilot research sites http://www.cimmyt.org/participatory-scaling-of-climate-smart-agriculture/

Output Used: The Department of Agriculture, Government of Bihar have initiated new schemes and planned investments for scaling CSA and CSVs across the Bihar state. Two project proposals on CSA built on CCFAS informed evidence got funded and are being implemented by Govt of Bihar

References Case:

https://ccafs.cgiar.org/publications/climate-change-adaptation-greenhouse-gas-mitigation-and-economic-profitability#.WKaIJOSB-Uk http://dx.doi.org/10.1016/j.fcr.2014.04.015
http://onlinelibrary.wiley.com/doi/10.1111/sum.12331/pdf
http://www.sciencedirect.com/science/article/pii/S0065211315300055
https://ccafs.cgiar.org/publications/economic-benefits-climate-smart-agricultural-practices-smallholder-farmers-indo#.WKaY8uSB-Uk
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=26-27
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=35-36

Primary 2019 outcome indicator(s):

● # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

Link between outcome story and and the FP Outcome(s): <Not Defined>

Annex uploaded:
https://marlo.cgiar.org/data/ccafs/projects//25/caseStudy/LAPA-Climate%20Smart%20Villages_28-08-2015.pdf

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>

Major Output groups - 2016
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** At least 2 peer reviewed high impact publications and policy briefs on CSAPs and case study highlighting upscaling of CSVs is recognized. **Brief summary of your actual 2016 contribution towards the selected MOG:** Evidence based interventions made the sub-national government appreciate and adopt the climate smart technology for further scaling. Government of Bihar established to adopt all 38 districts in state to make climate smart villages. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** Gender and social equity are taken into account as an approach towars scaling CSVs **Summary of the gender and social inclusion dimension of the 2016 outputs:** Role of women have been appreciated and recognised for special emphasis in the investment plan.
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** Relevant development champions identified and involved in CSVs. Historical climate analyses &climate change knowledgefor target locations made available to researchers,policy makers&farmers for prioritizingCSAPs **Brief summary of your actual 2016 contribution towards the selected MOG:** Several stakeholder consultations were across year for strategic planning, implementation and learning. The partnerships made helped tremendously in meeting the project outputs. Sharing and dissemination of the CSA supported mutual learning. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** gender and social inclusion are identified while undertaking deliverables **Summary of the gender and social inclusion dimension of the 2016 outputs:** Gender specific requirements were analysed in the consultations and targeted for empowerment

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Pilots of action research in across sites will generate Database and evidence for the adaptive capacity and environmental footprint of multi-commodity CSAPs within CSV pilots.

Brief summary of your actual 2016 contribution towards the selected MOG: Site-specific interventions of climate smart technology helped in building their adaptive capacity. There were studies undertaken to map the impact of enhanced adoption among various stakeholders.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Enhanced awareness, knowledge and capacity to implement CSAPs at scale

Summary of the gender and social inclusion dimension of the 2016 outputs: Women and socially disadvantaged groups were kept in consideration while disseminating knowledge in order to ensure their ability and capacity to adopt the technology. Thus the awareness programs and other capacity building activities were organised keeping their involvement for scaling.

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Atleast 2 peer reviewed publications on gender across contrasting typologiesof eastern& north-western IGP Database and evidences for the adaptive capacity and environmental footprint of multi-commodity CSAPs withinCSV pilots Socio-economic&genderdisaggregated quantified informationto understand farm-decision making adoption ofCSAPs in diverse farming system typologies in Haryana&Bihar

Brief summary of your actual 2016 contribution towards the selected MOG: Structured planning and evidence based interventions were made. In the project period strategic entry points were analyzed for the interventions with due recognition of development champions across typologies targeted for different groups to make the advantages flow to all segments of the society.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Women are integral part of socio-eceonomic upliftment of society across typologies

Summary of the gender and social inclusion dimension of the 2016 outputs: Across project sites women specific upliftment interventions are made and there have been positive response obtained. More work is being carried to uptake the activities for thier betterment.

Major Output groups - 2015

F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Developed robust gender-responsive framework for targeting and implementing CSAPs within CSVs for increased adoption. Evidence of CSAPs from CSVs are being used by the Govts Pilots of action research on CSAPs in 3 model CSVs each in Odisha, Karnataka, & Bangladesh were done. Major climate related stresses across sites identified

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towards scaling CSVs. A peer reviewed paper has been published

F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Case study of CSVs successes and their verification in Haryana. Pilots on CSVs at new locations and increased awareness and enhanced capacity of stakeholders including policy level engagements on climate literacy.

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towards scaling CSVs. Peer reviewed research articles have been published on gender. A framework on mainstreaming gender for scaling CSA.

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Evidence for the productive ,profitable, adapted and scalable CSAPs from the established ~50 CSV sites in Haryana & Bihar are quantified (Peer reviewed publications and report). Protocols and minimum data needs for verification of CSAPs are identified

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towars scaling CSVs

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Diversity of farming systems at sites described and tools/models for exploratory analysis of CSAPs are defined Capacity of NARS researchers enhanced through international course on Farming Systems design, targeting typology Synthesis report on conceptual framework of farming system typology developed Structural &functional farming systems typologies developed for Haryana, and Bihar

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towars scaling CSVs

Major Output groups - 2014

F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D2849 -

Main Information

Type:

Subtype:

Status: Cancelled

Year of expected completion: 2016

Justification of new expected date of completion:

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: <Not Defined>
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
<Not Defined>	<Not Defined>	Responsible

D2851 - Atleast one case study highlighting upscaling of CSVs in Haryana

Main Information

Type: Outreach products

Subtype: Factsheet, Project Note

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Evidence-informed policy formulation and implementation: A case study of sub-national policy for scaling Climate Smart Villages
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: English
Country: India
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/D2851.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible

D2852 - Documenting field outputs of CSAPs interventions in Haryana, Bihar and Punjab

Main Information

Type: Outreach products

Subtype: Social Media Output

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://ow.ly/alG6305hRmz%20%20http://ow.ly/iMlw305hSrG%20http://ow.ly/QuBR305hSzx%20http://ow.ly/ou8H305hSWd%20http://www.voanews.com/a/indian-farmers-battle-with-climate-smart-agriculture/3460162.html

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>

Description / Abstract: @CIMMYT & @CGIARClimate help farmers in #India apply optimal use of fertilizer w/ help of various tools. #Video: http://ow.ly/alG6305hRmz Direct Seeded Rice method by @CIMMYT @cgiarclimate reduces water, cost of cultivation & increases crop productionhttp://ow.ly/iMlw305hSrG @CIMMYT @cgiarclimate #video: Climate-friendly residue management w/ Happy Seader & Zero-Till machine good for soilhttp://ow.ly/QuBR305hSzx #Video: Women farmers' experiences on the adoption of #climate-smart technologies http://ow.ly/ou8H305hSWd via @CIMMYT & @cgiarclimate A story on CSA by the Voice of America http://www.voanews.com/a/indian-farmers-battle-with-climate-smart-agriculture/3460162.html

Publication / Creation date: <Not Defined>

Language: <Not Defined>

Country: India

Keywords: <Not Defined>

Citation: <Not Defined>

Handle: <Not Defined>

DOI: <Not Defined>
Creator / Authors: <Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible

D486 - Structural&functional farm household and farming systems typologies developed across/within sites for targeting CSAPs

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://edepot.wur.nl/396179

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Smallholder farmer perceptions on the Climate Smart Agriculture (CSA) practices in Bihar, India

Description / Abstract: Climate Smart Agriculture (CSA) is a recent concept launched by the FAO. It promotes technologies that increase productivity, promote resilience to related climate hazards and risks and contribute to climate change mitigation whenever possible. So far, previous research on CSA programs has mainly centered on case studies across the globe, surprisingly there are no agreed indicators to measure effectiveness. On the other hand, technology adoption is a widely studied topic that has given insights into different type of constraints. This study aimed to analyze the smallholder farmer and researchers perceptions of importance, effectiveness and adoptability of CSA and associated technologies and practices. Secondly, it aimed to assess the farmer context to design suitable farm scenarios with another MSc. Thesis project. It focused on the farmers, who are ultimately the end-users of the technologies. Therefore, 25 male farmers in Bihar (India) that were acquainted with the CIMMYT CSA program were interviewed. A questionnaire was designed to assess farmer objectives, constraints, and adoption of CSA Technologies (CSAT), and perceptions of climate change. In addition, Fuzzy Cognitive Mapping (FCM) inquired CIMMYT experts' perception on CSAT benefits and constraints.

Publication / Creation date: <Not Defined>

Language: English
Country: The Netherlands
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>	Responsible

D487 - Participatory validation of FS typologies with CSVs&potential effects of CSA interventions of diverse typologies assessed&documented

Main Information

Type: Reports and other publications

Subtype: Research workshop report

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.dropbox.com/s/8eqtyv0bxifajeo/Mai%20report.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type

CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>	Responsible

D488 - A methodological brief on statistical &empirical methodologies for capturing diversity of FS &climate risk vulnerability

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL:
https://www.dropbox.com/s/u1swo9cgdjoje0k/D%20488%20Methodological%20brief.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>

Description / Abstract: The study aims at understanding farming systems and their diversity at the village or community level. Often, statistically based typologies are developed at higher aggregation levels (i.e. district, province, country) and the sampling methods rarely allows to capture the diversity of farming systems within a village or community. Although sharing socioeconomic and biophysical context, within community diversity is usually important and depends on, among other, the needs and objectives of specific farm households, their trajectories, their particular opportunities and their attitude towards innovation and risk. The questions to be answered by this exercise are: i) What are the basic features of farming systems (it main limits, components, flows)? And ii) What is the diversity of farming system within the community?

Publication / Creation date: <Not Defined>

Language: English

Country: India

Keywords: <Not Defined>

Citation: <Not Defined>

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: <Not Defined>
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>	Responsible

D471 - Database and evidences for the adaptive capacity and environmental footprint of multi-commodity CSAPs withinCSV pilots

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Adoption of multiple climate smart agriculture practices in the Gangetic plains of Bihar, India

Description / Abstract: The adoption of climate smart agricultural practices (CSAPs) is important for sustaining Indian agriculture in the face of climate change. Despite considerable effort by both national and international agricultural organizations to promote CSAPs in India, adoption of these practices is low. This study examines the elements that affect the likelihood and intensity of adoption of multiple CSAPs in Bihar, India. The probability and intensity of adoption of CSAPs are analyzed using multivariate and ordered probit models, respectively. The results show significant correlations between multiple CSAPs, indicating that their adoptions are interrelated and there are opportunities to exploit the complementarities. The results confirm that both the probability and intensity of adoption of CSAPs are affected by numerous factors such as demographic characteristics, farm plot features, access to market, socio-economics, climate risks, access to extension services and trainings. Farmers that perceive high temperature as the major climate risk factors are more likely to adopt crop diversification and minimum tillage. Farmers are less likely to adopt Site Specific Nutrient Management if faced with short winters; however, they are more likely to adopt minimum tillage in this case. Training on agricultural issues is found to have a positive impact on likelihood as well as the intensity of CSAPs adoption. The major policy recommendations coming from of our results are to strengthen local institutions (public extension services, etc.) and to provide more training on CSAPs.

Publication / Creation date: <Not Defined>

Language: English

Country: India
Keywords: climate smart agricultural practices; minimum tillage; site-specific nutrient
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Publication Metadata

Volume:
Issue:
Pages:
Journal/Publisher name: International Journal of Climate Change Strategies and Management
Indicators for journal articles: ● This journal article is an ISI publication

Publication acknowledge: No
Flagships contribution: ● CCAFS - F2 (BEFORE F1 - ANDY)

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/D%20471.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/CSSRI%20Report.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/RCER%20Patna.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/IIFSR.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible
ICAR - Indian Council of Agricultural Research	Alagusundaram, K<ddgnrm@icar.org.in>	Other

D1400 - At least 2 peer reviewed high impact publications and policy briefs on CSAPs

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.sciencedirect.com/science/article/pii/S0167880916304649;%20http://www.sciencedirect.com/science/article/pii/S0360544216318746;%20http://www.sciencedirect.com/science/article/pii/S0378429016300818;%20http://www.sciencedirect.com/science/article/pii/S0167198716300447

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Conservation agriculture-based wheat production better copes with extreme climate events than conventional tillage-based systems: A case of untimely excess rainfall in Haryana, India

Description / Abstract: This study explores whether conservation agriculture-based wheat production system (CAW) can better cope with climatic extremes than the conventional tillage-based wheat production system (CTW). To assess this, we used data collected from 208 wheat farmers in Haryana, India in 2013–14 (a period with normal rainfall i.e., normal year) and 2014–15 (a period with untimely excess rainfall i.e., bad year) wheat seasons. Our analysis shows that whilst average wheat yield was greater under CAW than CTW during both bad and normal years, the difference was two-fold greater during the bad year (16% vs. 8%). This provides new evidence that CAW can cope better with the climatic extremes, in this case untimely excess rainfall, compared to CTW. Absolute yield of the CAW and CTW was 10% and 16% lower in the bad year compared to the normal year, respectively. Extreme climate events, such as excess rainfall during wheat season, can occur once in every four years in Haryana and result in a loss of income to both farmers, through a loss of yield, and

the government, through compensatory payments to farmers. If, as targeted by the Haryana government in 2011, one million ha of wheat was brought under CAW, the state would have produced an additional 0.66 million Mg of wheat in 2014–15, equivalent to US$ 153 million. This is an important finding given the increased vulnerability of wheat production to climatic variability in this region.
Publication / Creation date: 2016-09-01
Language: English
Country: India
Keywords: <Not Defined>
Citation: Aryal, J.P., Sapkota, T.B., Stirling, C.M., Jat, M.L., Jat, H.S., Rai, M., Mittal, S., and Sutaliya, J.M. 2016. Conservation agriculture-based wheat production better copes with extreme climate events than conventional tillage-based systems: A case of untimely excess rainfall in Haryana, India. Agriculture, Ecosystems and Environment 233: 325–335
Handle: <Not Defined>
DOI: http://dx.doi.org/10.1016/j.agee.2016.09.013
Creator / Authors: <Not Defined>

Publication Metadata

Volume: 233
Issue: 2016
Pages: 325-335
Journal/Publisher name: Agriculture, Ecosystem and Environment/Elsevier
Indicators for journal articles: ● This journal article is an ISI publication
● This article have a co-author from a developing country National Agricultural Research System (NARS)
● This article have a co-author based in an Earth System Science-related academic department
Publication acknowledge: Yes
Flagships contribution: ● WHEAT
● CCAFS - F2 (BEFORE F1 - ANDY)

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Mittal, Surabhi<s.mittal@cgiar.org>	Other
BISA - Borlaug Institute for South Asia	Kumar Jat, Dr. Raj<r.jat@cgiar.org>	Other
ICAR - Indian Council of Agricultural Research	Alagusundaram, K<ddgnrm@icar.org.in>	Other

D472 - Historical climate analyses &climate changeknowledgefor target locations made available to researchers,policy makers&farmers for prioritizingCSAPs

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:

- N/A

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary:

- File: https://marlo.cgiar.org/data/ccafs/projects//472/deliverable/Dictionary/long%20term%20karnal-1982-2012.xls

Are the tools used for data collection available:

- File: https://marlo.cgiar.org/data/ccafs/projects//472/deliverable/Tools/Weather%20(Daily-2012).xls

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/D%20472.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
ICAR - Indian Council of Agricultural Research	Alagusundaram, K <ddgnrm@icar.org.in>	Responsible
BISA - Borlaug Institute for South Asia	Kumar Jat, Dr. Raj<r.jat@cgiar.org>	Other

D473 - Relevant development champions identified and involved in CSVs

Main Information

Type: Outreach products

Subtype: Article for media/Magazine/Other (not peer-reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/D%20473.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible
IRRI - International Rice Research Institute	Lada, J K<j.k.ladha@irri.org>	Other
ICAR - Indian Council of Agricultural Research	Alagusundaram, K<ddgnrm@icar.org.in>	Other

D474 - Socio-economic&genderdisaggregated quantified informationto understand farm-decision making adoption ofCSAPs in diverse farming system typologies in Haryana&Bihar

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:

- Gender
- Capacity Development

Gender level(s):

- Analysis of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Farm household typologies and food security: An ex-ante assessment from Eastern India

Description / Abstract: One of the great challenges in agricultural development is the assurance of social equity in food security oriented interventions. Development practitioners, researchers, and policy makers alike could benefit from prior insight into what interventions or environmental shocks might differentially affect farmers' food security status, in order to move toward more informed and equitable development. We examined the food security status and livelihood activities of 269 smallholder farm households (HHs) in Bihar, India. Proceeding with a four-step analysis, we first applied a multivariate statistical methodology to differentiate five primary farming system types. We next applied an indicator of food security in the form of HH potential food availability (PFA), and examined the contribution of crop, livestock, and on- and off-farm income generation to PFA within each farm HH type. Lastly, we applied scenario analysis to examine the potential impact of the adoption of 'climate smart' agricultural (CSA) practices in the form of conservation agriculture (CA) and improved livestock husbandry, and environmental shocks on HH PFA. Our results indicate that compared to livestock interventions, CA may hold considerable potential to boost HH PFA, though primarily for wealthier and medium-scale cereal farmers. These farm HH types were however considerably more vulnerable to food insecurity risks resulting from simulated drought, while part-time farmers and resource-poor agricultural laborers generating income from off-farm pursuits were comparatively less vulnerable, due in part to their more diversified income sources and potential to migrate in search of work. Our results underscore the importance of prior planning for development initiatives aimed at increasing smallholder food security while maintaining social equity,

while providing a robust methodology to vet the implications of agricultural interventions on an ex ante basis.
Publication / Creation date: <Not Defined>
Language: English
Country: India
Keywords: Socio-ecological system; scenario evaluation, climate smart agriculture;
Citation: <Not Defined>
Handle: <Not Defined>
DOI: Article in press
Creator / Authors: <Not Defined>

Publication Metadata

Volume:
Issue:
Pages:
Journal/Publisher name: Agricluural Systems/Elsevier
Indicators for journal articles: ● This journal article is an ISI publication

Publication acknowledge: Yes
Flagships contribution: ● CCAFS - F2 (BEFORE F1 - ANDY)

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/AGSY_2016_409_Original_V0-1.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/D474-%20Gender%20paper.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/TAGS-S-16-00203%20Int%20Journal%20of%20Agricultural%20Sustainability.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/474.pdf
https://marlo.cgiar.org/data/ccafs/projects//25/deliverableDataSharing/Typology%20Brief%20Bihar.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>	Responsible

D2043 - A publication (report, research paper, policy brief) on business cases

Main Information

Type: Reports and other publications

Subtype: Conference paper / Seminar paper

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Youth
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.isa-india.in/wp-content/uploads/2016/12/Lead-paper-Vol.-4.pdf#page=44

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Climate smart agriculture practices led business cases: Some examples

Description / Abstract: Agriculture faces the enormous challenge of feeding the world's growing population. Although crop yields have grown impressively in the last few decades, production still requires an increase by another 60-70% by 2050 to meet the demand (Grist, 2015). Climate change poses additional challenges to agriculture, particularly in developing countries. Although the impacts of climate change on agricultural systems vary by region, most agriculture is rainfed and highly vulnerable to changes in temperature (especially extremes) and increased variability in precipitation. By 2100 global average temperature will get risen between 2.6 and 4.8°C, but some parts of the world, may experience temperature increases of up to 11°C. This, in turn, will alter precipitation patterns, including where, when and how much precipitation falls. Combined, these changes will increase the frequency and intensity of extreme weather events such as floods, heat waves, snowstorms and droughts. This may further lead to sea level rise and salinization. All of these changes will have profound impacts on agriculture (FAO, 2013). In general, the lower latitudes will experience lower crop and livestock productivity. Short term impacts are less well understood due to modelling uncertainties and inability to isolate direct causality, but evidence to date shows that extreme events are increasing in frequency and significantly damage food crops. Sub-Saharan Africa will face the most significant decreases in yields by 2100, according to the Met Office (2014). Wheat and maize yields will decline in the Indian subcontinent, while rice and soybean production are likely to increase (Met Office, 2014).

Publication / Creation date: 4th International Agronomy Congress,

Language: Engslidh

Country: India

Keywords: Business model, climate smart agriculture

Citation: Groot, Annemarie, Rooker, Jaclyn, Brun, Karianne DE and Jat, M.L. 2016. Climate Smart Agricultural Practices led Business Cases: Some Examples. In: Lead Papers Vol. 4 : 4th International Agronomy Congress, Nov. 22–26, 2016, New Delhi, India, P 38-42
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible
WUR - Wageningen University and Research Centre	Groot, Annemarie<annemarie.groot@wur.nl>	Other

D1436 - Atleast 2 peer reviewed publications on gender across contrasting typologiesof eastern& north-western IGP

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: 2017

Cross-cutting dimension:

- Gender

Gender level(s):

- Analysis of sex-disaggregated data
- Monitoring/impact assessment of gender outcomes of research/innovations/interventions/polices

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://journals.sagepub.com/doi/abs/10.1177/0971852416639772;%20Cathy%20R%20Farnworth;%20Stirling,%20C.M.,%20Sapkota,%20T.B.,%20Jat,%20M.L.,%20Misiko,%20M.%20and%20Simon,%20A.%202016.%20Gender%20and%20inorganic%20nitrogen:%20what%20are%20the%20implications%20of%20moving%20towards%20a%20more%20balanced%20use%20of%20nitrogen%20fertilizer%20in%20the%20tropics?.%20International%20Journal%20of%20Agricultural%20Sustainability.%20DOI:10.1080/14735903.2017.1295343.

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Role of Mobile Phone-enabled Climate Information Services in Gender-inclusive Agriculture

Description / Abstract: The mobile phone-enabled information delivery mechanism has the potential to reduce the knowledge gap between large and small farmers, and also across gender by creating awareness about new technologies and best practices. This article focuses on how access to information through the mobile phone makes women feel empowered if they are receptive to the information they receive. It also seeks to find out the type of information most valuable to women. This was done by analyzing the listening behavior of farmers, both men and women, to information provided by mobile phones. This study was undertaken in the selected villages in two states of India—Haryana and Bihar. The findings of the study show that information delivered through mobile phones under this pilot project contributed towards reducing information asymmetry among farmers,

in general, and between women and men farmers. The listening rate of women farmers was equivalent to that of men farmers. Participating farmers reported that precise and timely weather-based agro-advisory messages helped them in taking informed decisions about input use, thus leading to savings on irrigation and reducing the cost of other inputs such as pesticides and fertilizers. Women farmers also said that agro-advisory messaging helped them make more efficient use of inputs by increasing their knowledge about climate-smart technologies.
Publication / Creation date: 2016-05-01
Language: Englsih
Country: India
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Publication Metadata

Volume: 20
Issue: 2016
Pages:
Journal/Publisher name: Asian Institute of Technology
Indicators for journal articles: ● This journal article is an ISI publication
● This article have a co-author from a developing country National Agricultural Research System (NARS)

Publication acknowledge: Yes
Flagships contribution: ● CCAFS - F2 (BEFORE F1 - ANDY)

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Mittal, Surabhi <s.mittal@cgiar.org>	Responsible

D2972 - Advanced Training Course on Conservation Agriculture: Asia

Main Information

Type: Training materials

Subtype: Lecture/Training Course Material

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Youth
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.cimmyt.org/annual-course-on-conservation-agriculture-held-in-south-asia/

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Annual course on conservation agriculture held in South Asia

Description / Abstract: As climate change continues to challenge food systems globally, sustainable agriculture offers a viable solution to help mitigate the effects of and help farmers adapt to drought, heat and other climate change effects. However, a gap in availability and access to sustainable technology and practices prevent many farmers from adopting sustainable agriculture. The International Maize and Wheat Improvement Center (CIMMYT) under the aegis of CRPs on CCAFS and WHEAT has been organizing an annual Advanced Course on Conservation Agriculture for seven years to meet this gap. The two week course was held in November, 2016 with 25 participants from Iran, Afghanistan, Bangladesh, Nepal and India. The course builds on CIMMYT's capacity development and training activities of students, partners and staff.

Publication / Creation date: <Not Defined>

Language: English

Country: India

Keywords: Conservation Agriculture, Climate smart agriculture, Precison agriculture, Mechanization, Youth,

Citation: <Not Defined>

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible

D2973 - International Workshop on Farming Systems Intensification in South Asia

Main Information

Type: Training materials

Subtype: Lecture/Training Course Material

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Youth
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.cimmyt.org/farming-systems-intensification-in-south-asia/

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Farming Systems Intensification in South Asia

Description / Abstract: Although agriculture in the Indo-Gangetic Plains of South Asia, heartland of the Green Revolution, is essential to the food security and livelihoods of smallholder farmers, it is one of the most vulnerable regions to climate change variability. To cope with climate change variability and impacts, several climate-smart agricultural practices (CSAPs) have proved to increase crop productivity, resilience and adaptive capacity in the region's agro-ecological zones. However, farmers' perceptions of climate vulnerability and their response to CSAPs vary with their biophysical and socioeconomic circumstances, which can limit technology targeting and large-scale adoption by a diversity of farmers. Research aimed at understanding farming systems level opportunities and challenges has been conducted in order to promote sustainable agricultural intensification and develop a portfolio of CSAPs adapted to local conditions and diverse farm typologies.

Publication / Creation date: <Not Defined>

Language: English

Country: Netherlands

Keywords: Farming systems, Typology, MFarm Design modeling

Citation: <Not Defined>

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

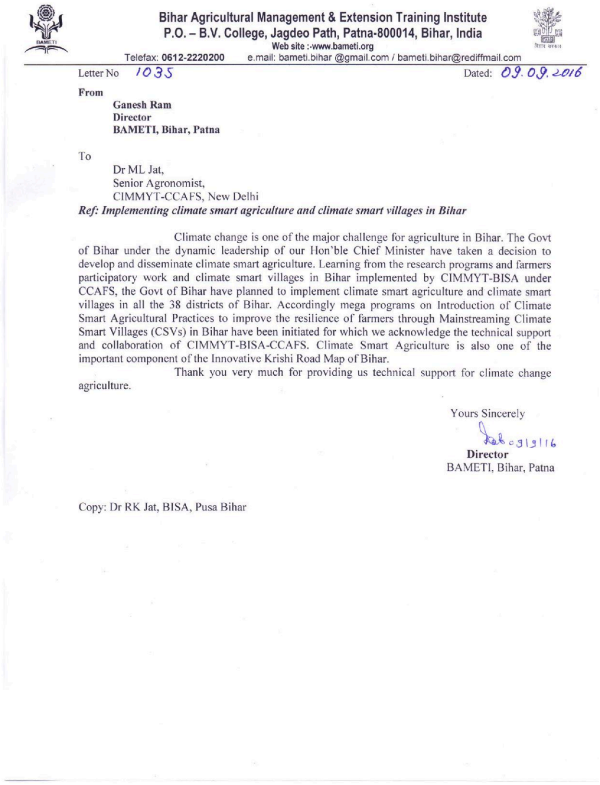
Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible

5.3 Project Highlights

Project highlight 254

Title: Government of Bihar issues letter for scaling CSVs across all 38 districts of the state



Bihar Agricultural Management & Extension Training Institute
P.O. – B.V. College, Jagdeo Path, Patna-800014, Bihar, India
Web site :-www.bameti.org
Telefax: 0612-2220200 e.mail: bameti.bihar @gmail.com / bameti.bihar@rediffmail.com

Letter No 1035 Dated: 09.09.2016

From
Ganesh Ram
Director
BAMETI, Bihar, Patna

To
Dr ML Jat,
Senior Agronomist,
CIMMYT-CCAFS, New Delhi

Ref: Implementing climate smart agriculture and climate smart villages in Bihar

Climate change is one of the major challenge for agriculture in Bihar. The Govt of Bihar under the dynamic leadership of our Hon'ble Chief Minister have taken a decision to develop and disseminate climate smart agriculture. Learning from the research programs and farmers participatory work and climate smart villages in Bihar implemented by CIMMYT-BISA under CCAFS, the Govt of Bihar have planned to implement climate smart agriculture and climate smart villages in all the 38 districts of Bihar. Accordingly mega programs on Introduction of Climate Smart Agricultural Practices to improve the resilience of farmers through Mainstreaming Climate Smart Villages (CSVs) in Bihar have been initiated for which we acknowledge the technical support and collaboration of CIMMYT-BISA-CCAFS. Climate Smart Agriculture is also one of the important component of the Innovative Krishi Road Map of Bihar.

Thank you very much for providing us technical support for climate change agriculture.

Yours Sincerely
Director
BAMETI, Bihar, Patna

Copy: Dr RK Jat, BISA, Pusa Bihar

Author: JAT, ML	**Subject:**
Publisher:	**Year reported:** 2016
Project highlights types: ● Participatory action research ● Capacity enhancement ● Inter-center collaboration ● Policy engagement	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Govt of BIhar, Climate smart villages, Policy implementation, 38 districts, BAMETI, CIMMYT	**Countries:** India

Highlight description: With CCAFS informed science backed evidence, knowledge, enhanced capacity and improved climate literacy of key decision makers, the climate smart agriculture practices have been mainstreamed in the Government of Bihar's investment and agricultural development plan targeting climate smart villages (CSVs) to be implemented across all 38 districts helping several hundreds of thousands small holder men and women farmers to improve their food, nutrition and

livelihoods while coping with climate risks.

Introduction / Objectives: Increased awareness and capacity of local govt officers and other stakeholders to design and implement Climate-Smart Villages in Bihar. The Department of Agriculture, Government of Bihar have initiated new schemes and planned investments for scaling CSA and CSVs across the Bihar state. Two project proposals on CSA built on CCFAS informed evidence got funded and are being implemented by Govt of Bihar

Results: Evidence on climate smart agriculture practices and Climate-Smart Villages in CCAFS's pilot sites implemented by CIMMYT-BISA and partners. Development and assessment of portfolio of CSA interventions in Climate-Smart Villages. Increased awareness and capacity of local govt officers and other stakeholders to design and implement Climate-Smart Villages in Bihar. Policy decision for scaling climate smart agriculture in Bihar: Based on series of consultations, capacity development and sharing evidence, the Bihar Agricultural Management & Training Institute (BAMETI), Government of Bihar have taken decision to implement climate smart agriculture and CSVs in all 38 districts of Bihar. Innovation platform developed doe scaling of activities with strategic stakeholder interventions

Partners: Key research partners includes national agricultural research system [Indian Council of Agricultural Research (ICAR), State Agriculture Universities], Borlaug Institute for South Asia (BISA), Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Bayer Crop Science, and CGIAR centers. Department of Agriculture, Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Farmer cooperatives, service providers and private sector (machine manufacturers, seed companies). CIMMYT-BISA linkages with the leading NGOs in the region are planned for targeting the women engaged in agriculture. Capitalizing on their women groups and disseminating CSA knowledge is intended to achieve gender equity in agriculture.

Links / Sources for further information:
https://ccafs.cgiar.org/publications/climate-change-adaptation-greenhouse-gas-mitigation-and-economic-profitability#.WKaIJOSB-Uk http://dx.doi.org/10.1016/j.fcr.2014.04.015
http://onlinelibrary.wiley.com/doi/10.1111/sum.12331/pdf
http://www.sciencedirect.com/science/article/pii/S0065211315300055
https://ccafs.cgiar.org/publications/economic-benefits-climate-smart-agricultural-practices-smallholder-farmers-indo#.WKaY8uSB-Uk
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=26-27
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=35-36

Project highlight 255

Title: Conservation agriculture-based wheat production better copes with extreme climate events than conventional tillage-based systems: A case of untimely excess rainfall in Haryana, India

Author: Aryal, J.P., Sapkota, T.B., Stirling, C.M., Jat, M.L., Jat, H.S., Rai, M., Mittal, S., and Sutaliya, J.M	**Subject:**
Publisher: Agriculture, Ecosystem and Environment	**Year reported:** 2016
Project highlights types: ● Participatory action research ● Capacity enhancement ● Breakthrough science ● Policy engagement ● Food security	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Conservation agriculture-based wheat production systems, Conventional tillage-based wheat production systems, climatic extremes, rainfall variabiiility, India	**Countries:** India

Highlight description: This study provides first of its kind hard evidence as how CA based wheat production helps in minimizing climate risks in addition to reducing production cost, improving resource use efficiency, yield and farmers income while reducing environmental foot prints. Such evidence helps policy planners to priorities the investments for scaling such CSA technologies.

Introduction / Objectives: Wheat plays a dominant role in global food security as it contributes almost 20% of the total dietary calories and proteins worldwide and almost 24% in South Asia and is facing frequent climatic risks. This study was undertaken to explores whether conservation agriculture-based wheat production system can better cope with climatic extremes than the conventional tillage-based wheat production system. To assess this, we used data collected from 208 wheat farmers in Haryana, India in 2013–14 (a period with normal rainfall i.e., normal year) and 2014–15 (a period with untimely excess rainfall i.e., bad year) wheat seasons.

Results: This study has four main conclusions: i) the magnitude of yield loss in wheat during a bad year was less in CAW than CTW providing evidence that conservation agriculture-based practices in wheat are an effective adaption response to excessive and untimely rainfall events that are becoming more frequent in North-West India, ii) As CAW delivers yield advantages in both good and bad years, it is feasible to promote CAW even without subsidy. However, increasing farmer's knowledge and building their confidence on CAW through regular trainings are essential, iii) CAW can serve as climate risk adaptation measures irrespective of farm size, iv) analysis of long-term weather data from Haryana showed that one in every four year can be bad year in terms of extreme rainfall during wheat season, and thus, CAW can be a cost effective means of adapting to rainfall variability during the wheat season. Given the cost to the government of compensation payments to farmers following the aftermath of adverse climate events, effective management of subsidy and economic incentives to adopt CAW is a critical issue. Lack of timely availability of machines, knowledge of and confidence in CAW are three major constraints to uptake by farmers. Therefore, there is a need to provide a series of field-based workshops demonstrating CA-based technologies to farmers and local service providers.

Trainings and mobilization of local service providers together with agricultural research institutions and universities can enhance further adoption of CAW whilst raising awareness amongst key decision makers of the evidence that now exists of the associated economic and adaptative benefits.

Partners: <Not Defined>

Links / Sources for further information: http://dx.doi.org/10.1016/j.agee.2016.09.013

Project highlight 257

Title: Conservation agriculture in irrigated intensive maize-based systemsof north-western India: Effects on crop yields, water productivity andeconomic profitability

Author: CM Parihar, SL Jat, AK SIngh, B Kumar, Yadvinder-Singh, S. Pradhan, V Pooniya, A Dhauja, V Chaudhary, ML Jat, RK Jat and OP Yadav	**Subject:**
Publisher: Field Crops Research	**Year reported:** 2016
Project highlights types: ● Successful communications ● Food security	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Maize based systems, net returns, glucose equivalent yield, water productivity	**Countries:** India

Highlight description: <Not Defined>

Introduction / Objectives: In north-western India, maize-based systems are being advocated as an alternative to rice-based systems to address the issues of resource degradation, particularly declining water tables and climate-change-induced variability in rainfall and temperature. Conservation agriculture (CA) based best-bet crop management practices may increase crop and water productivity, while conserving and sustaining natural resources. In a long-term study on conservation agriculture, we have evaluated the performance of CA-based management practices for four intensified irrigated maize systems to explore the alternate water and other resource use efficient systems under the emerging challenges of resource degradation and climate risks..

Results: Significant (P 0.05) tillage and cropping system interactions were observed for system productivity. Agronomic performance (yield attributes) of all the crops (except wheat) grown in sequence with maize was maximum with zero till (ZT), however wheat outperformed on permanent beds (PB) over ZT and conventional tillage (CT). In the initial two years, higher system productivity (maize equivalent yield) was recorded in PB (8.2–8.5 Mg ha?1), while from third year onwards ZT registered maximum productivity (11.3–12.9 Mg ha?1).The system glucose equivalent yield increased by 0.6 Mg ha?1under ZT and PB compared to CT. Economic prof-its from maize-based rotations were invariably higher either in maize-mustard-mungbean (MMuMb) or maize-wheat-mungbean (MWMb) systems, while in terms of glucose equivalent yield, maize-maize-sesbania (MMS) and MWMb rotation were highest. Synergistic effects of summer legumes (mungbean and Sesbania) after winter legume/oilseed/cereal were observed on yield of individual crop vis-a-vis system productivity and irrigation water use. ZT and PB practices reduced the irrigation water requirement by 40–65 ha-mm and 60–98 ha-mm, respectively compared to CT system, resulted enhanced system water productivity by 19.4% equally under both ZT and PB. Net profit from the maize-based systems under ZT was up to 31% higher with 72$ ha?1lower production cost compared to CT. Results from our study showed that adoption of CA based tillage practices in MMuMb and MWMb system for sustainable increase of crop and water productivity in north-western region of India.

Partners: Indian Council of Agricultural Research Punjab Agricultural University CIMMYT Borlaug Institute for South Asia

Links / Sources for further information: http://dx.doi.org/10.1016/j.fcr.2016.03.013

Project highlight 258

Title: Long term effect of conservation agriculture in maize rotations on total organic carbon, physical and biological properties of a sandy loam soil in north-western Indo-Gangetic Plains

Author: CM Parihar, MR Yadav, SL Jat, AK SIngh, B Kumar, S Pradhan, D Chakraborty, ML Jat, RK Jat, YS Saharwat and OP Yadav	**Subject:**
Publisher: Soil and Tillage Research/Elsevier	**Year reported:** 2016
Project highlights types: ● Capacity enhancement ● Inter-center collaboration ● Food security	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Diversified crop rotations, Enzymatic activity, organic carbon, soil physical properties, Tillage practices	**Countries:** India

Highlight description: <Not Defined>

Introduction / Objectives: Alternate tillage practices are important management strategies for tackling the issues of soil health deterioration and over exploitation of underground water resources, particularly in intensive crop rotations. The conservation agriculture based tillage and crop establishment practices such as zero tillage (ZT) and permanent raised beds (PB) hold potential to enhance SOC, physical and biological properties for sustainability of soil health. A long term study was conducted to evaluate the twelve combinations of tillage practices and irrigated intensive maize based crop rotations on organic carbon, physical properties and microbial biomass and enzymatic activities of a sandy loam soil in north-western India.

Results: The tillage practices consisted of ZT, PB and conventional tillage (CT) in main plots and four diversified intensive maize based crop rotations (MWMb: Maize-Wheat-Mungbean, MCS: Maize-Chickpea-Sesbaina, MMuMb: Maize-Mustard-Mungbean, MMS: Maize-Maize-Sesbania) in sub plots. In this study we analysed the SOC, physical and biological properties of soil at various depths after 7 years of continuous ZT, PB and CT in diversified maize rotations. Compared to CT plots, the soil physical properties like water stable aggregates (WSA) > 250 mm were 16.1-32.5% higher, and bulk density (BD) and penetration resistance (PR) showed significant (P 0.05) decline (11.0–14.3 and 11.2–12.0%) in ZT and PB plots at 0–15 and 15–30 cm soil layers. The soil organic carbon (SOC) increased by 34.6-35.3% at 0–15 cm, and 23.6-26.5% at 15–30 cm soil depths with conservation agriculture (ZT and PB) based crop establishment techniques over CT. Similarly, the soil microbial biomass carbon (MBC) under CA based systems increased by 45–48.9% in 0–30 cm profile depth of a sandy loam (Typic Haplustept) soil. Significant (P 0.05) improvement in soil enzymatic activities i.e., Fluorescein diacetate, dehydrogenase, b Glucosidase and Alkaline phosphatase was also recorded in the CA based treatments. Significant (P 0.05) synergistic effects of summer legumes (mungbean and Sesbania) with winter legume/cereal in crop rotations were observed on SOC,WSA, BD, PR and Ksat at 0–15 and 15–30 cm depths. Interaction between tillage and crop rotations were significant (P 0.05) for soil organic carbon, physical properties and enzymatic activities. Thus our long-term study suggests that CA based crop management with selected diversified maize based rotations (MCS and MWMb) can be advocated as sustainable intensification strategy in light textured soils of north-western India

and other similar agro-ecologies of South Asia.
Partners: Indian Council of Agricultural Research Borlaug Institute for South Asia CIMMYT ICARDA
Links / Sources for further information: http://dx.doi.org/10.1016/j.still.2016.04.001

Project highlight 262

Title: Bio-energy, water-use efficiency and economics of maize-wheat-mungbean system under precision-conservation agriculture in semi-arid agro-ecosystem

Author: CM Parihar, SL Jat, AK SIngh, K Majumdar, ML Jat, YS Saharawat, S Pradhan, BR Kuri	**Subject:**
Publisher: Energy/Elsevier	**Year reported:** 2016
Project highlights types: ● Successful communications ● Breakthrough science ● Inter-center collaboration ● Food security	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Conservation agriculture, energy, Glucose and protein equivalent yield, Water-use efficiency, nutrient management	**Countries:** India

Highlight description: Precision conservation agriculture (PCA) increased renewable energy use efficiency. Lower requirements of fuel and water make PCA a better option. Higher bio-energetic yield and economic profit in precision conservation agriculture. Maize + Wheat + mungbean residue shares the highest in total input energy use.

Introduction / Objectives: The maize-wheat-mungbean (MWMb) cropping system is being advocated as an alternative to the traditional rice-based cropping systems of north-western Indo-Gangetic Plains to address the issues of energy and nutrition, residue burning, decline in biomass productivity and water tables. In semi-arid regions, the climate-change-induced variability in rainfall and temperature may have an impact on phenological responses of cereals and pulses which in turn would affect biomass production, economic yield and energy and water-use efficiency (WUE) of the crops. To quantify bioequivalent yields, energy requirement, economics and WUE of MWMb system for better understanding of this cropping system, this study was undertaken.

Results: The results of this 4-year study conducted under different tillage and nutrient management showed that zero tillage (ZT) and permanent beds (PB) had significantly higher pooled average (17.2-20.3%) biomass productivity, net returns (34.4-39.8%) and biomass water-use efficiency (49.8-66.2%) with lesser (8.5-16.1%) water-use than the conventional till (CT). Significantly higher pooled bioenergetics yields (21.7-35.2%), net returns (31.4-37.8%) and biomass water-use efficiency (30.1-35.2%) was observed in SSNM/Ad-hoc plots compared with FFP plots. The total pooled energy input in ZT/PB and SSNM/Ad-hoc plots was significant (P 0.05) higher than CT and FFP plots, respectively, with greater net energy output, energy productivity and energy efficiency. The interactions between tillage and nutrient management practices on pooled input energy and energy productivity of MWMb system was significant (P 0.05). Thus, adoption of conservation tillage (ZT/PB) practices with improved nutrient management (SSNM/Ad-hoc) could be a viable option for achieving higher biomass productivity, water and energy-use efficiency and profitability in MWMb system. These novel results showed great promise for similar South Asian agro-ecologies for sustainability of cereal based system. Thus, CA-based tillage/crop establishment practices supplemented with plant nutrients through renewable resources like residue biomass layered with SSNM/Ad-hoc nutrient management

may be deployed for improving bioenergetic yields, biomass productivity, water and energy use efficiency and economic profit under MWMb system. Moreover, if the policy makers can able to attract Indian farmers' inclination towards intensification of traditional maize-wheat cropping system with mungbean for only 50% of existing area (total 1.86 mha) it would be able to meet out the protein demand of additional 8.1 million malnourished populations every year.

Partners: Indian Council of Agricultural Research (ICAR) CIMMYT International Plant Nutrition Institute (IPNI) ICARDA

Links / Sources for further information: http://dx.doi.org/10.1016/j.energy.2016.12.068

6. Activities

A252 - Framework for targeting adoption of CSAP portfolios by a diverse farm household types within CSVs

Description: Effective targeting of CSAPs requires understanding of diversity of farm households and farming systems, their main components, characteristics, interrelationships and flows. Farm household typologies provide systemic understanding of diversity among and similarity within, coherent groups of farm households and their corresponding farming systems with different structural and functional characteristics. Typologies for different project sites will identify groups of farm households based on farm structural features (agro-ecologies, farm/household size, gender, livelihood, commercial activities and socio-economic indicators) as well as on functional characteristics related to crop-livestock management systems, performances, and resulting productivity. In addition, perceived and actual vulnerability to climate risk and available adaptation strategies based on CSAPs will be integrated in typology to identify groups of farm households that CSAP?s should be targeting. The farm household typologies will be validated within CSVs in coherence with A251. The validation results will be used for developing analogues of the CSAPs vis-?-vis farm typologies.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Lopez Ridaura, Santiago <s.l.ridaura@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: During 2016 we developed, in collaboration with local partners, different approaches and tools within a framework for targeting CSAP to different farm household types in different regions of the IGP. Notably, in Bihar (where data and collaborations are strongest), we have used the farm household typologies to assess their potential food availability based on their resources and agricultural activities and assess scenarios on the impact of different CSAP and climatic shocks. Also, we have used typologies developed for Bihar to study the perception of CSAP by farmers and parametrise a farm level model (FarmDesign) to explore alternative options of CSAP for climate smart agriculture and assess trade-off between indicators for different types of farms. We organized a course workshop in WUR on systems analysis and modelling and we have been able to engage the Indian Institute for Farming Systems Research in the application of the framework to other case studies.

Deliverables in this activity:

● D483: Synthesis report on conceptual framework of farm household/farming system typology, components/methodology harmonized across sites
● D484: Diversity of farming systems at sites described and tools/models for exploratory analysis of CSAPs defined
● D486: Structural&functional farm household and farming systems typologies developed across/within sites for targeting CSAPs
● D488: A methodological brief on statistical &empirical methodologies for capturing diversity of FS &climate risk vulnerability
● D490: Peer review publications on structural&functional typologies of farm households& farming systems for climate change adaptation.
● D476: Database&evidences for adaptive capacity&environmental footprint of multi-commodity CSAPs in crop-livestock mixed FS within CSV pilots
● D489: Participatory validation of farming system typologies within CSVs,and potential effects of CSAPs in diverse typologies
● D490: Peer review publications

A678 - Developing & defining innovative business models and open innovation platforms for scaling (CSAPs)

Description: This activity involves an iterative process to scan, define and address opportunities and barriers for developing, piloting and scaling business cases for CSAPs. Innovation platforms will be established around CSAPs. At the local level, these innovation platforms consist of developers of CSAPs, customers of the CSAPs (in CSVs) and, stakeholders from marketing, retail, investment and policy domains. Second, meta-innovation platform, involve members operating at higher governance levels e.g. investors, policy makers, national research/extension institutes, NGOs and local innovation platforms. Innovation platforms will lead in the development, piloting and scaling-up of climate smart agri-business models. Principle approach is to capture and further develop agri-business opportunities at local level and scaling-up these business opportunities to a higher spatial level. A geographically differentiated approach of CSA measures and strategies will be adopted for identification of Business Opportunities?, ?defining Potential Business Cases?, ?transforming them into actual Business Cases? and piloting and scaling these businesses.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Jat, ML <m.jat@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Guidelines for initiation, facilitation and M&E of an innovation platform as mechanism to develop and scale climate smart agribusiness have been developed. Through existing innovation networks farmers interact with national &international research organisations and service suppliers to discuss business opportunities to test and further develop CSAPs like Laser Land Levelling or the Happy Seeder. In Bihar discussions with farmers and service providers about business models supporting CSA have started. Potential business cases have been further prioritised with the use of the criteria: Climate smartness; interest of potential customers, producers and service providers; experiences with business development; and, potential to become self-sustainable after three to four years. This prioritisation resulted into a shortlist of potential business cases like baby corn production or nutrient management. The value propositions of climate smart agriculture technologies and practices for the private sector, government and male and female farmers have been considered

Deliverables in this activity:

- D2042: Stories describing the lessons learnt on developing business cases in Haryana, Bihar, Punjab and Bangladesh
- D2043: A publication (report, research paper, policy brief) on business cases
- D2066: Strategy for scaling (local) CSA Business cases in Haryana, Bihar, Punjab and Bangladesh
- D2067: Peer reviewed publication/ Report/ Case study on CSA led business case

A708 - Science-based, scalable evidences for climate smart agricultural practices (CSAPs) identified&implemented through Climate Smart Villages (CSVs)

Description: Database and evidences of CSAPs developed, refined and tested for different commodities and agro-ecological zones in CCAFS and related projects will be used for developing comprehensive CSAPs portfolios. Innovative approaches will be used to integrate the knowledge and information to harness the benefits at a larger scale specifically for smallholder farming communities. This includes systems analysis (combining seasonal climate forecasts, historical weather analysis, crop/soil modelling and participatory approaches) to identify, potentially adoptable CSA practices, strategies that are differentiated by agro-ecosystem and farm typology and that are gender responsive. The CSAP portfolios will be evaluated within climate smart villages for multi-commodity systems that contribute to food security, social equity, adaptive capacity and mitigation. The study will built on the existing CSVs in Haryana, Bihar and Punjab (India) and new CSVs will be piloted as learning sites for evidence base in the new geographies (Karnataka, Odisha, Andhra Pradesh in India; and Bangladesh).

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Jat, ML <m.jat@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Additional evidence (high impact publication, reports, database) on multi-commodity portfolio of CSAPs generated from the CSVs helped in creating awareness of CSA among the stakeholders specially policy planners using social media, success stories and case studies. Analyzed long-term climatic data which helped stakeholders to understand climatic risks. We documented (high impact publication) the first hard evidence from CSVs on how CA helps in adapting wheat to climate risks which created policy level awareness. The Government of Bihar have taken a decision for scaling CSA and CSVs across all the districts of Bihar which has been reported as an outcome case study. The development champions have been identified for scaling CSAPs targeting some specific CSAPs needs immediate action with expected large impact, for example happy seeder technology for eliminating residue burning in Haryana and Punjab. Capacity of large number of women and men stakeholders enhanced though large number of events.

Deliverables in this activity:

- D477: Participatory ex-ante scenario assessment to understand possible trajectories towards incorporation of CSAP portfolios within livelihoods
- D2068: Atleast one peer reviewed publication on gender-responsive study to adaptation and scaling of CSAPs
- D2069: Atleast 2 peer reviewed publications on CSAPs adaption led mitigation schemes
- D2071: Policy level engagement for investment on scaling CSAPs at aleast one sub-national level government
- D2070: Multi-stakeholder capacity enhancement on adoption and widespread of CSAPs, involving policy makers and target groups

7. Leverages

No leverages added

Title: Participatory evaluation and application of climate smart agriculture practices to enhance adaptation to climate change in mixed smallholder systems

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2018	RP EA	Radeny, Maren <M.Radeny@cgiar.org>

Funding source types	Status	Lead Organization	Project leader
W1/W2, Bilateral	Complete	CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo - Mexico	Misiko, Michael <m.misiko@cgiar.org>

Project is working on

Flaship(s)
F2 (before F1 - Andy): Climate-Smart Technologies and Practices

Region(s)
EA: East Africa

Project summary

Maize, legumes and cassava are major staple crops in eastern Africa, usually produced by crop-livestock smallholders under rainfed conditions. Maize and legumes are amongst the most sensitive crops to weather variability and climate change, whereas cassava is regarded as amongst the least sensitive crops. Livestock plays key roles in helping farmers cope with different types of shocks. This project will synthesise knowledge and data generated under CCAFS Phase I (and related bilateral projects) on climate smart agricultural (CSA) practices to produce acceptable, gender-responsive CSA portfolios. Based on available climate data, we will identify and map key vulnerabilities and climate risks as well adaptation strategies to guide participatory CSA portfolio evaluation. We will evaluate and determine social, productivity and economic impacts and tradeoffs of different CSA portfolios through systems' modelling and participatory approaches. The project will work closely with CCAFS Climate Smart Villages, flagship and bilateral projects and CRPs.

2. Partners

Partner #1 (Leader)

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Misiko, Michael <m.misiko@cgiar.org>	Activity 2014-397 *Leader*. contribution to tool development, methods, (data collection where possible) writing (and review), M&E process, knowledge sharing, partnerships, and capacity development. Activity 2014-318 *Partner*. Activity 2014-324 *Leader*.	HQ
Partner	Tesfaye Fantaye, Kindie <k.tesfayefantaye@cgiar.org>	Activity 2014-312 *Leader*.	HQ
Partner	Tongruksawattana, Songporne <s.tongruksawattana@cgiar.org>	Activity 2014-305 *Leader*.	HQ
Partner	De Groote, Hugo <h.degroote@cgiar.org>	Activity 2014-322 *Leader*.	HQ

Partner #2

Institution: CIAT - Centro Internacional de Agricultura Tropical

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Sommer, Rolf <r.sommer@cgiar.org>	Collaborative activity: contribution to tools development, methods, (data collection where possible) writing (and review), M&E process, knowledge sharing. Lead Activity #3, and contribute significantly to activity #4, and #5 especially for activities involving beans and soils. Activity 2014-305 *Partner*. Activity 2014-312 *Partner*. Activity 2014-322 *Partner*. Activity 2014-324 *Partner*. Activity 2014-318 *Leader*.	Nairobi, Kenya

Partner #3

Institution: ILRI - International Livestock Research Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Ericksen, Polly <p.ericksen@cgiar.org>	Provide leadership and input to all activities involving livestock components, especially incorporation of forage crops into CSAP portfolios for scaling. contribution to tool development, methods, (data collection where possible) writing (and review), M&E process, knowledge sharing, partnerships, and capacity development. Contribute to activity #3, #4, and #5 Activity 2014-305 *Partner*. Activity 2014-312 *Partner*. Activity 2014-318 *Partner*. Activity 2014-322 *Partner*. Activity 2014-324 *Partner*. NOTE: ILRI is no longer part of this project	HQ

Partner #4

Institution: IITA - International Institute of Tropical Agriculture

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	van Asten, Piet <p.vanasten@cgiar.org>	Provide leadership and input to all activities involving cassava components, especially incorporation of cassava into CSAP portfolios for scaling. Contribution to tool development, methods, (data collection where possible) writing (and review), M&E process, knowledge sharing, partnerships, and capacity development. Contribute to activity #3, #4, and #5 Activity 2014-312 *Partner*. Activity 2014-318 *Partner*. Activity 2014-322 *Partner*. Activity 2014-324 *Partner*.	HQ

Partner #5

Institution: KALRO - Kenya Agricultural and Livestock Research Organization

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Kisilu, Raphael <rkkisilu@gmail.com>	Lead SIMLESA implementing partner in Kenya Activity 2014-397 *Partner*.	HQ

Partner #6

Institution: SARI - Selian Agricultural Research Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Sayula, George <gsayula@hotmail.com>	Objective/ Activity 4 - field CSAP evaluation and partnerships in Tanzania	HQ

Partner #7

Institution: Ministry of Agriculture, Kenya-Kenya

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Kinywee, Julius <kinyweejulius@gmail.com>	See the many partners above	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	Although the Project is closing, there is huge interest in the activities among above partners. There is also seed insurance coming on board, while media and FAO are looking forward to increase their collaboration with PEACSA. The Min. of Agric has requested an extension of the field programme to nature the scaling component, including Innovation Platforms. There were no site activities in Tanzania and Uganda i n 2016 due to funding cuts.

Partnerships overall over the last reporting period:

There were major changes in this project's partnerships due to funding shortfalls. ILRI dropped out in 2015. IITA and CIAT dropped during 2016. Partnerships with CRS ended prematurely. CIMMYT therefore relied on other partners for i) field evaluation ii) scaling/application. These include a) KALRO (NARS) b) Dpt. of Agri. Extension. _Wote c) FAO - CA evaluation d) Dryland Seeds Company - supplying CIMMYT-released varieties e) Anglican Development Services-Eastern - application of CSA f) ICRISAT - dryland legumes (esp. Pigeon pea) g) ICIPE - Push and Pull technology (plus animal feed). h) AGROZ - business company, promoting storage technologies (hermetic bags)

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
CCAFS Site	-1.809	37.724	Makueni
CCAFS Site	-0.621	31.484	Kagera Basin
CCAFS Site	-4.79	38.417	Usambara
Country			Kenya
Country			United Republic of Tanzania
CCAFS Site	-0.269	35.068	Nyando
Country			Uganda

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
In 2019 National Agricultural Research Institutions (KALRO – Kenya, NARO – Uganda, ARI – Tanzania), national agricultural development programmes (e.g. ASDSP in Kenya, ASDP in Tanzania), major international NGOs (e.g. CRS), national level NGOs, and IARCs including other CRPs and CG centres are applying best-bet CSA portfolios co-developed through the project. Besides, these organizations are further developing and packaging appropriate CSA options based on delivery mechanisms designed by the project, while public and private agro-advisory services are scaling out the packages beyond target sites. Finally, complementarity with the PABRA alliance and bilateral projects (SIMLESA) enables further scaling of the CSA options. These will lead to increased agricultural productivity, enhanced food security, higher incomes, and resilience. National and subnational governments in the four countries are institutionalizing principles of participatory research and agricultural innovation platforms, including through integration into agricultural extension activities, and creating opportunities for equitable agricultural investments through public-private-non-profit partnerships.

Annual progress towards outcome (end of 2016*): Public–private–non-profit actors at national and sub-national levels are initiating new partnerships which provide the basis for incentive mechanisms based on the Agricultural Innovation Platform approach that explicitly promote CSA along several value chains, informed by CCAFS science. The first set of evaluation data on CSA options and promising endogenous practices are discussed among project partners (including CRS, national NGOs and the three NARIs), and lessons are derived to optimize the second round of testing in 2017.

Annual progress towards project outcome in the current reporting cycle (2016*): As reported above under partners, public–private–non-profit actors at national and sub-national levels are engaging in innovative partnerships. These partnerships are based on complementarity; different benefits/ incentives. In 2017, all partners mentioned above are contributing to the recently CIMMYT-initiated Agricultural Innovation Platform (AIP) in Wote. This AIP is hinged on the principle of reducing risks of CSA-based agriculture e.g. reducing service/ input costs, interceding in a dysfunctional market, diversifying livelohhods - e.g. mango processing or export, etc. The second set of evaluation data on CSA options and promising endogenous practices are being discussed among participating project partners. It must however be noted that CSA options are not climate proof - drought in 2017 in eastern Africa meant the main season was NOT possible.
How communication and engagement activities have contributed to achieving your Project outcomes:* February 16-17, 2017 were set aside for a major field day in Wote, Kenya. All partners discussed above (under partners) were present. CIMMYT communication staff recorded this event fully, both on-station and on farm. On 17th, media attended. This coverage and media presence was organised by our sister projects funded by USAID and ACIAR.
Evidence documents of progress towards outcomes:* <Not Defined>

Annual progress towards outcome (end of 2015): Project partners and public institutions at national and subnational levels are informed by CCAFS science on climate risks and vulnerabilities, the captured diversity of maize-bean-cassava-livestock small holder systems, and initial data on farm household typologies for gender-response targeting of CSAP portfolios in maize-bean-livestock smallholder systems. First-sets of CSAPs are identified and discussed with partners in workshops. This provides the basis for the participatory testing and evaluation of CSAPs in 2016 and 2017. "FOR REPORTING IN Sep 2015: At least 3 million farmers receiving and benefiting from CSA-supporting information and services in 2015 through a network of more than 2000 farm supply businesses"

Annual progress towards outcome (end of 2017): Established Agricultural Innovation Platforms in the three sites are providing feedback, including through field evaluations and documentation of CSA options, providing a platform for learning among national and sub-national governments, private sector participatory planning and action based on CCAFS science. An advanced set of evaluation data on CSA options and promising endogenous practices are discussed among project partners (including NGOs and the three NARIs), and lessons are derived to optimize the final round of testing for lessons recording in 2018.

Annual progress towards outcome (end of 2018):

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* Funding availability.

4.2 CCAFS Outcomes

RP EA Outcome 2019: National Agricultural Research Institutions (KARI, NARO, ARI, EIAR), IARCs, and Ministries of Agriculture are developing and packaging appropriate CSA technologies and practices to increase agricultural productivity, enhance food security, incomes and mitigation, and build resilience; Agro-advisory services are testing and using new delivery mechanisms for CSA adoption.

Indicator #1: # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

2019

Target value: 4

Cumulative target to date: 16

Target narrative: By 2019, KALRO (Kenya), NARO (Uganda), SARI (Tanzania) are adopting and scaling (institutionalizing, sharing) CSAPs as a result of participatory testing and evaluation, and innovative partnerships (PPPs). CRS, World Vision and the local NGOs (AGMARK, EFA, CIDI) are applying the best-bet CSAPs and further developing and packaging them to reach new communities as a result of participatory evaluations and PPPs. At least two sub-national governments have institutionalized the participatory research approach and innovation platforms, making the CSAPs part of their official extension services, as a result of the continuous engagement through policy dialogue.

The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015

Target value: 4

Cumulative target to date: 4

Target narrative: In 2015, the project is developing mechanisms to characterize the diversity and climate risk environments of farm households and farming systems to co-evaluate CSAPs with NARIs in the four project countries. This will support co-learning and sharing of information in order to identify synergies and opportunities.

The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 8
Cumulative target to date: 12
Target achieved: 8.0
Target narrative: NARIs in the three countries (KALRO, NARO, SARI), CRS, and three national NGOs (CIDI, EFA, AGMARK) participate in the testing and evaluation of CSAPs, providing feedback. New partnerships that enable participatory testing are strengthened or initiated.
Narrative for your achieved targets, including evidence: The main initiatives include: a) KALRO (NARS) b) Dpt. of Agri. Extension. of Wote County c) FAO - CA evaluation d) Dryland Seeds Company - supplying CIMMYT-released varieties e) Anglican Development Services-Eastern - application of CSA f) ICRISAT - dryland legumes (esp. Pigeon pea) g) ICIPE - Push and Pull technology (plus animal feed). h) AGROZ - business company, promoting storage technologies (hermetic bags). This is based on mutual interest, and therefore it is sustainable.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: By and large, more than 60% of farmers participating in the CSA evaluation, receiving CSA portfolio advice, and actively participating in Agricultural Innovation Platforms have been women. Each of the three evaluation activities in Wote, for instance, drew more than 350 participants. On each occasion, over 70% were women. The more elusive goal is that of youth - average age of participation in PEACSA was around 45, a true reflection of general farming age.
The expected annual gender and social inclusion contribution to this CCAFS outcome: At least 30% of farmers participating in the CSA evaluation, receiving CSA portfolio advice, and actively participating in Agricultural Innovation Platforms are women and youth.

Major Output groups:

● F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

● F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

RP EA Outcome 2019: Subnational and national governments adopting Climate Smart Villages models and scaling up CSA practices to other farming communities in line with Local Adaptation Plans of Agriculture (LAPAs), providing feedback to researchers and agro-advisory agencies and creating opportunities for investments through local investment partnerships for productivity and enhanced resilience.

Indicator #1: # of public-private actors at national and sub-national levels are using new incentive mechanisms or business models/ markets that explicitly promote climate smart approaches along the value chain, using CCAFS science

2019
Target value: <Not Defined>
Cumulative target to date: 8
Target narrative: <Not Defined>
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 0
Cumulative target to date: 0
Target narrative: <Not Defined>
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 8
Cumulative target to date: 8
Target achieved: 4.0
Target narrative: 8 of public-private actors at national and sub-national levels are partnering through AIP, based on innovative business models to scale CSA along the value chain, using CCAFS science
Narrative for your achieved targets, including evidence: These 4 are new partners who were not participating in 2015.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: As explained above, an average of about 60% participating farmers are women. Membership of the established AIP in Wote is 70% women. Note, however, that membership is household based. Therefore, these are not exclusive processes based on gender membership.
The expected annual gender and social inclusion contribution to this CCAFS outcome: Increased participation among rural target women, from 30% in 2017, to at least 43% based on AIP membership and decision making in initiated CSA broad activities.

Major Output groups:

● F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
Activity 2014-305: Through linkages with other FP, and CRPs. Activity 2014-312: Through collaboration with other FP projects, and CRPs Activity 2014-318: Through collaboration with other FP projects, and CRPs Activity 2014-322: Through collaboration with other FP projects, and CRPs, bilateral projects (esp. SIMLESA) Activity 2014-324: Through collaboration with other FP projects, and CRPs, bilateral Projects (esp. SIMLESA) Activity 2014-397: Extensive linkages to aligned projects within CIMMYT and collaborating partners, CRPs, etc.

Collaborating with other CRPs

Maize
Description of collaboration: Development of Institutional Innovations, especially based on the Agricultural Innovation Platform approach.

4.4 Case Studies

No case studies added

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>

Major Output groups - 2016

F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: 1. Agricultural Innovation Platforms in three sites established, functioning to align key actor efforts to support the application of CSA portfolios tested by the project 2. Supporting, through partnerships with other projects, CCAFS EA, local partners in CSVs to test new CSA practices for enhanced adaptive capacity and resilience

Brief summary of your actual 2016 contribution towards the selected MOG: 1. Agricultural Innovation Platform (in Wote, Kenya) established, functioning to align key actor efforts to support the application of CSA portfolios tested by the project - see preceding sections for partnerships. 2. Fully aligned with CIMMYT's DTMAS and SIMLESA projects and local CCAFS EA partner initiatives to apply CSA options.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Gender targets in participation will be achieved through Agricultural Innovation Platforms (AIP). AIPs are planned as vehicles to identify and apply business niche identification that target women, youth and marginalised capacities for sustainable intensification.

Summary of the gender and social inclusion dimension of the 2016 outputs: As explained in details, over 60% of participants in key evaluation and scaling activities are women. Most of these members in Wote (Kenya) are members of a local Agricultural Innovation Platform (AIP). This AIP is being implemented as based on existing business niches identified in 2016.

F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: 1. AIP (explained in FP 1 - MOG #3) 2. Building on lessons from AGMARK Partnership outcomes, and through SIMLESA, dissemination tools will be improved to reach more farmers beyond current project sites including through extension services, more than 2000 agro-dealers project countries, devolved governments, private sector, academia (e.g. Makerere)

Brief summary of your actual 2016 contribution towards the selected MOG: Field CSA evaluations implemented as scaling events. These are multi-stakeholder activities - e.g. the February 16-17, 2017 media and learning events/fora in Wote. Partnerships have contributed to the promotion, co-creation and learning related to CSA. CIMMYT has handed over the scaling to development initiatives, including Department of Agriculture (Wote, Kenya).

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: As explained in FP 1 - MOG #3 above

Summary of the gender and social inclusion dimension of the 2016 outputs: As explained above in preceding sections.

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: 1. Push and pull technology 2. Drought tolerant Maize, legumes (common bean, pigeon pea, etc.) and cassava 3. post harvest loss reduction - grain storage technologies 4. CA 5. Forage varieties (developed at CIAT)

Brief summary of your actual 2016 contribution towards the selected MOG: 1. Push and pull technology 2. Drought tolerant Maize, legumes (common bean, pigeon pea, etc.) 3. post harvest loss reduction - hermetic grain storage technologies 4. CA based options - FAO contribution in Wote (Kenya) 5. Forage varieties (Brachiaria - developed at CIAT).

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Target at least 25% participation of women in field CSAP testing, and support of gender sensitive business models through AIP approach (for scaling CSAPs).

Summary of the gender and social inclusion dimension of the 2016 outputs: Target of 25% participation of women in field CSAP testing was surpassed. As explained above, PEACSA has had over 60% women participation. These women, interviews show, are often representatives of their households. The established AIP core mandate is livelihood diversification. This is a co-developed theme among PEACSA partners in Kenya.

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: 1.Business based partnerships (based on AIP) to engage private sector e.g. to disseminate CSA materials, grain storage bags, etc 2. Innovative CSA prioritization, led by CIAT in 2015, lessons further refined and applied in 2016 through participatory testing for wide scale adoption, local adaptation, and sharing.

Brief summary of your actual 2016 contribution towards the selected MOG: 1. Partnerships in Kenya, including private sector actors e.g. Acre Africa (insurance) and AGROZ Company (disseminating hermetic grain storage bags). 2. Wider CSA lessons are being further generated, will be refined at end of 2016/2017 season and hopefully applied in 2017 through scaling and adaptation. There is need for funding.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Gender is a key factor in the partnerships being set up, including targeted dissemination of CSAPs. The 2015 CSA prioritization factored in gender and social includion as a key determining factor.

Summary of the gender and social inclusion dimension of the 2016 outputs: As explained in preceding sections, Gender is being integrated in all partnership activities, including in the scaling of CSAPs. The 2016 CSA prioritisation has been unable to target youth as effectively as women..

Major Output groups - 2015

F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: i) Working closely with CCAFS EA, especially in CSV to test CSA technologies and further pre-PEACSA work ii) Formation of AIP in Wote - initiated with 7 farmer groups (hosting CSA trials) - establishment in 2016 iii) Enhancing the role of agri-business in scaling CSA - (CCAFS working paper https://cgspace.cgiar.org/rest/bitstreams/60041/retrieve)

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Bullet ii. above This is work in progress - an inclusive AIP is scheduled to be established in Wote in mid 2016

F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: This is done through the partner project SIMLESA: i) In Tanzania, a participatory content development programme for sms has been rolled out ii) In 2016, three more activities are planned in new sites, including in one CCAFS site

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: i) ongoing follow up studies in three sites of AGMARK's work show out of the 1,500,000 scaling materials distributed, 30% reached women-led households ii) All PEACSA research activities have prioritised gender desegregation - focus group discussions, farmer field days and farm typology work

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: CSA options: i) Crop diversification. Cassava [drought, mosaic-tolerant varieties, lower soil fertility(?)] - IITA lines ii) Drought-tolerant (DT) maize (CIMMYT) iii) DT/rust-tolerant common bean (CIAT) iv) Low moisture tolerant Pigeon pea (ICRISAT) v) Grain storage (CIMMYT) vi) Push and pull (ICIPE) vii) Forage (bracharia) (ICIPE/CIAT) viii) Soil fertility management (CIAT)

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: The 2015 season is only concluding. We're harvesting CSA trials, end-of-season participatory evaluations NOW happening in all sites i) Gender desegregated data are being collected/analysed ii) All field events (on-farm/on-station) have ensured gender/ social inclusion (reports being processed) iii) Linkages (SIMLESA) have provided extra funds leverage for social inclusion (AIP)

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Customised decision support tools for CSA prioritisation (used in guiding field testing for local adaptation) (PEACSA Activity 3) - achieved. See reports

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Data were gender desegregated in the preceding activity (3)

Major Output groups - 2014
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2014 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2014 contribution towards the selected MOG:** <Not Defined> **Brief`2014 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2014 outputs:** <Not Defined>
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2014 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2014 contribution towards the selected MOG:** <Not Defined> **Brief`2014 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2014 outputs:** <Not Defined>
F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2014 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2014 contribution towards the selected MOG:** <Not Defined> **Brief`2014 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2014 outputs:** <Not Defined>

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D690 - Maps and narratives indicating spatial and temporal distribution of climate risks, biophysical and socioeconomic vulnerabilities

Main Information

Type: Data, models and tools
Subtype: Maps/Geospatial data
Status: Extended
Year of expected completion: 2015
New expected year: 2016
Justification of new expected date of completion: See report. This involves several steps.
Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Restricted Use Agreement - Restricted access (if so, what are these periods?)
Restricted access until: <Not Defined>
License adopted: <Not Defined>

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: Draft Report - with maps
Publication / Creation date: Dec 2015
Language: English
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

Process of data quality assurance: <Not Defined>
Data dictionary: <Not Defined>
Are the tools used for data collection available: <Not Defined>

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//39/deliverableDataSharing/PEACSA%20_Activity%202_Feb

2016_Kindie.docx

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Tesfaye Fantaye, Kindie <k.tesfayefantaye@cgiar.org>	Responsible

D691 - Report on current vulnerabilities and risks for Wote, Lushoto and Rakai describing their social distribution

Main Information

Type: Reports and other publications
Subtype: Research workshop report
Status: Extended
Year of expected completion: 2015
New expected year: 2016
Justification of new expected date of completion: As explained under Activity 690
Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Restricted Use Agreement - Restricted access (if so, what are these periods?)
Restricted access until: <Not Defined>
License adopted: <Not Defined>

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: As explained under Activity 690
Publication / Creation date: Dec 2015
Language: English
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type

CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Misiko, Michael <m.misiko@cgiar.org>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	De Groote, Hugo<h.degroote@cgiar.org>	Other

D678 - A synthesis report on farm household and farming system typology: objective, structure, components and methodology

Main Information

Type: Reports and other publications

Subtype: Research workshop report

Status: Extended

Year of expected completion: 2015

New expected year: 2016

Justification of new expected date of completion: Field data collection, done. Data are being analysed for detailed publication. A summary report was prepared to guide on-going objective 4 and 5 activities - see attachment

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No

Open access: Yes

License adopted: <Not Defined>

Deliverable Metadata

Disseminated title: <Not Defined>

Description / Abstract: The first phase of the activity 1 "Capturing the diversity of maize-bean-cassava-livestock small holder systems and developing farm household typologies for targeting CSAP's portfolios" consisted in focus group discussions with farmers from the CCAFS sites led by CIMMYT in three sites: Wote (Kenya), Lushoto (Tanzania) and Rakai (Uganda). The preliminary outputs were a selection of variables created and selected by farmers in gender differentiated groups. Farmers were asked to identify the four most important variables that can be used to classify their community of farmers. For each variable, farm /household types were given, with characteristics for each as well as information on the cropping/livestock system and /or the management of these farms. Finally, farmers indicated the proportion of each type in their community. Four groups (two women and two men groups) participated in this activity in each site, for a total of 16 FGD. The results were then analyzed to produce a typology of farmer household for each site. Per site, variables across the four groups were compared to find similarities or differences. In all three site three types of farms were described. These results are described below. These results will lead the sampling strategy for activity 3. We will sample 3 villages per CCAFS site. In each village one farm of each group be sampled thus 3 farms per village, a total of 9 farms per CCAFS site. We will conduct HH surveys with the selected farmers. Data collected will be used for modelling case study farms with the model FarmDESIGN. The baselines will be modelled first. Scenarios will be modelled later on including CSA portofolio according to the results of Module 3 CSA selection and prioritization from these past FGD.

Publication / Creation date: Aug 5, 2015

Language: English

Country: <Not Defined>

Keywords: <Not Defined>

Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Misiko, Michael <m.misiko@cgiar.org>	Responsible

D826 - Method for assessing social distribution of future climate risks in collaboration with modellers

Main Information

Type: Data, models and tools

Subtype: Data portal/Tool/Model code/Computer software

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: <Not Defined>
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Tesfaye Fantaye, Kindie <k.tesfayefantaye@cgiar.org>	Responsible

D843 - Initial data/ lessons on participatory evaluation shared, including preferred CSAPs, potential application, etc.

Main Information

Type: Reports and other publications

Subtype: Conference paper / Seminar paper

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Participatory evaluation and application of climate smart agriculture practices in mixed smallholder farming systems: a case-study in the semi-arid regions of Kenya
Description / Abstract: In the first phase of the CCAFS Program (Climate Change, Agriculture and Food security), climate-smart agriculture practices (CSAP) were identified and needed to be tested. In the semi-arid maize-growing areas of Kenya, dry-tolerant varieties and maize-legume intercropping appeared as the most appropriate CSAP, and this paper presents farmer's evaluation of these farming systems. During on-station and on-farm trials in Makueni County, participatory evaluation of intercropping systems of five maize varieties and four beans varieties was conducted. In total, 150 farmers participated; they scored each variety on the basis of several phenotypic criteria and provided an overall score for the variety. Results emphasized the complexity of their varieties' perception. In order to explain the overall score by different agronomic and socio-economic factors, a cumulative mixed model effect was estimated, including random effects for each farmer. Dry-tolerant varieties had a significant lower score, as GLP92 for beans and TEGO for maize. Socio-economic factors including age and gender of the participants influenced the overall score of varieties. We demonstrated that farmers who already purchased improved seed tended to give lower score. Finally, an OLS regression allowed exploring the weight of each phenotypic criterion in the overall score of a maize or bean varieties. This analysis revealed that farmer's perception of a good variety is complex and rely on multiple criteria unlike most of the breeding program mainly based on yield oriented indicators.
Publication / Creation date: 2016-05-01
Language: English
Country: Kenya

Keywords: Ordinal regression, Participatory evaluation, maize-bean intercropping, climate-smart agriculture
Citation: Berre, D., Ndegwa, M., Karuiki, S., De Groote, H. and Misiko,. M. 2016. Participatory evaluation and application of climate smart agriculture practices in mixed smallholder farming systems: a case-study in the semi-arid regions of Kenya. International Maize and Wheat improvement Center, Nairobi, Kenya.
Handle: -
DOI: -
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//39/deliverableDataSharing/Submitted%20for%20review%20(2).docx

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Misiko, Michael <m.misiko@cgiar.org>	Responsible

5.3 Project Highlights

No project highlights added

6. Activities

A305 - Capturing the diversity of maize-bean-cassava-livestock smallholder systems and developing farm household typologies for targeting CSAPs

Description: Effective targeting of CSAPs requires understanding and capturing the diversity of farm households and farming systems, characteristics, interrelationships and flows. Farm household typologies provide a systemic understanding of diversity among, and similarity within, coherent groups of farm households and their corresponding farming systems with different structural and functional characteristics. Typologies for the different locations of this project will identify groups of farm households based on farm structural features (including gender composition and socio-economic indicators) as well as on characteristics related to crop-livestock management systems, performances, and resulting productivity. In addition, perceived and actual vulnerability to climate risk and available adaptation strategies based on crop-livestock CSAP's will be integrated in the typology work. Most efficient use of existing data and information (from on-farm trials) will be prioritised but primary information (from surveys, in-depth qualitative interviews and focus discussions) will need to be generated and shared.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Misiko, Michael <m.misiko@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: i) Diversity of farm households and farming systems, characteristics - field work complete. Data being processed ii) Farm household typologies - Tables being edited iii) Gaps being identified, and further research preferred See documents attached in the report.

Deliverables in this activity:

<Not defined>

A312 - Current and future climate risks/ vulnerabilities identified and mapped for refined, gender-response targeting of CSAPs

Description: This activity will identify major climate related risks, and how these interact with farmers' biophysical and socioeconomic contexts that influence their capacity to cope. This will be largely achieved using previous work from CCAFS and other projects, including household survey data and results from climate change projections, agricultural, biophysical and bio-economic modelling. By understanding these complexities, we shall be able to situate the participatory process and target CSAP effectively.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Tesfaye Fantaye, Kindie <k.tesfayefantaye@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Finalising reports - draft available (attached in the system. We have delayed in this activity due to lack of complete weather data in Tz Lushoto and Ug Rakai

Deliverables in this activity:

<Not defined>

A318 - Determine the potential scale and nature of impact of different CSAP portfolios

Description: This activity comprises a scientifically rigorous screening of the possibly suitable CSAPs and selection of a sub-set of portfolios that has the highest chances to perform in the given biophysical, institutional and socioeconomic context of each selected site. This will be done ex-ante by using CCAFS' CSA prioritization toolkit, and based on a participatory evaluation. The potential scale (community and households) as well as the impact of the selected CSAPs in regard to the three pillars sustainability, adaptation/resilience and mitigation, as well as their gender-sensitiveness will be determined by integrated modeling and trade-off analysis (e.g. using the point-scale crop model, CropSyst, the farm household model, FarmDesign, as well as the landscape scale model, LandscapeIMAGE). Results will be optimized iteratively by repeated integration of feedbacks from activity 4. Best-bet CSAP will be evaluated – "what is likely to perform?" – and ranked in terms of potentials for scaling out.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIAT - Centro Internacional de Agricultura Tropical Sommer, Rolf <r.sommer@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: <Not Defined>

Deliverables in this activity:

<Not defined>

A322 - Participatory evaluation of gender-responsive CSAP portfolios and formulation of recommendations for uptake and scaling

Description: Gender-responsive technology evaluation with farmers, public, non-government and private actors in Agricultural Innovation Platforms (AIP). Results from participatory analyses of CSAP use, adaptation and adoption will be analysed along with previous farmer preferences and findings from adoption surveys and combined with modelling to guide work under output 5. The target is to have CSAP options for scaling-out that meet different institutional and socioeconomic contexts.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo De Groote, Hugo <h.degroote@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: i) First season of evaluations being completed. This cycle has to be repeated in 2016, before any lessons can be recorded. ii) AIPs are being initiated (as reported in preceding sections

Deliverables in this activity:

<Not defined>

A324 - Communication strategies and tools co-developed and applied for wider use to scale CSAPs

Description: This work is the culmination of output number 1-4. Public, non-government and private actors, will test a combination of suitable approaches to share CSAPs (among women and men farmer entities) and other beneficiaries. This process will be based on participatory evaluation of effectiveness of approaches for wider and inclusive reach. An effective M&E plan will be formulated to ensure efficient combination of strategies is developed. This activity will feed into the Flagship 1.3 project working with the Africa CSA Alliance, besides the partner projects.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Misiko, Michael <m.misiko@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: This is largely dependent on Activities 1-4. The different combinations of suitable approaches to share CSAPs can only be assessed after at least 2 full years of Activity 4, which anchors field scaling studies. This activity is also linked to SIMLESA. For instance the communication strategy is being co-authored with SIMLESA communication officer.

Deliverables in this activity:

<Not defined>

A397 - (BILATERAL) Objective 4. SIMLESA: support the development of local/ regional innovations systems and scaling modalities

Description: Objective 4. of SIMLESA (simlesa.cimmyt.org) is the core "activity" of the Project's Phase II. It has four outputs: --Output 4.1: Developed policy options and organizational models for the delivery of CA-based intensification options (also building on existing Innovation Platforms [IP]) --Output 4.2 Strengthened multi-stakeholder interaction mechanisms for uptake and scaling out of CA-based intensification options (incl. 15 innovation platforms and value chain interventions) --Output 4.3: CA-based intensification options scaled-out more widely through competitive and commissioned grants in each of the 5 countries --Output 4.4: Knowledge sharing of relevant program innovations (including sms, information decision guides, leaflets, etc.)

Start date: Jan 2015 **End date:** Jun 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Misiko, Michael <m.misiko@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Complete: i) Policy on organisational models - a ministerial level roundtable held in Uganda. It had high relevance for PEACSA - DTM maize seed, AIPs (see two briefs by M. Misiko) ii) AIPs - as reported in preceding sections, these are scheduled for 2016 establishment. Initiation work is ongoing iii) CGS - being rolled out in April 2016. This has far reaching (positive) implications for PEACSA as explained in preceding sections iv) An sms programme has been initiated in Ke and Tz. This is in collaboration with Queensland University (QAAFI), Australia

Deliverables in this activity:

<Not defined>

7. Leverages

No leverages added

Title: Develop Index insurance for drought-prone maize and bean-based farming systems in East Africa to enhance farmer adoption of climate-adapted germplasm

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2018	F4	Hansen, James <jhansen@iri.columbia.edu>

Funding source types	Status	Lead Organization	Project leader
W1/W2, Bilateral	On-going	CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo - Mexico	Hellin, Jonathan <j.hellin@cgiar.org>

Project is working on

Flaship(s)
F4 (before F2 - James): Climate services and safety nets

Region(s)
EA: East Africa
WA: West Africa

Project summary

Drought leads to crop yield losses and reduced food and livelihood security. Drought-tolerant germplasm is available but the risk of drought prevents farmer adoption. Insurance helps farmers manage risks and invest in inputs without worrying about crop losses and increased debt. Index insurance is a way to reduce risk and boost the use of agricultural inputs and equipment, leading to increased and more stable crop production. Index insurance can be combined with credits for insured smallholders, as the risk of non-repayment for lenders is reduced. It makes participation in the market for agricultural insurance and credit attractive for the private sector. Index insurance needs to be attractive and affordable to farmers, and profitable to insurers. This project will develop and test in East Africa and Nigeria a scientifically-validated design of drought insurance bundled with climate-adapted germplasm. Appropriate index insurance products will be developed with farmers, insurers, re-insurers and seed companies..

2. Partners

Partner #1 (Leader)

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Hellin, Jonathan <j.hellin@cgiar.org>	Activity 2014-137 *Leader*. Activity 2014-270 *Leader*. Activity 2014-273 *Leader*. Activity 2014-274 *Leader*.	Addis Ababa, Ethiopia

Partner #2

Institution: IRI - International Research Institute for Climate and Society

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Greatrex, Helen <greatrex@iri.columbia.edu>	IRI will work with CIMMYT on: 1) Bringing together key actors to explore the feasibility of developing indices for maize-based farming systems in East Africa and Nigeria. 3) Writing three journal articles and a document that captures lessons leant from existing crop index insurance targeted at resource-poor farmers. One article will focus on index insurance and social equity Activity 2014-137 *Partner*. Activity 2014-274 *Partner*.	HQ

Partner #3

Institution: Columbia University-United States

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Coordinator	Greatrex, Helen <greatrex@iri.columbia.edu>	Helen is leading on a lessons learnt and scaling paper that builds on her extensive knowledge of index insurance initiatives from around the world. She is also leading on the activities linked to the design and implementation of an impact assessment of Nigerian index insurance. In Nigeria, Helen works closely with Pula Advisors (Rose Goslinga, ex. CEO of Kilimo Salama. The work looks at fertilizer sales in Kaduna district and whether sales increase when index insurance is offered.	HQ

Partner #4

Institution: University of Reading-United Kingdom

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Fisher, Eleanor <e.fisher@reading.ac.uk>	Dr Fisher is an anthropologist with much experience of the impact of cash transfers on social equity. She is working with the project to look at issues of index insurance and social equity (including gender). There are no budgetary implications for the project of this collaborative work. The partnership has borne fruit in terms of a paper on index insurance and equity having been submitted to the journal Development Policy Review. Dr Fisher has also being invited to the CCAFS writeshop in Galway where she will present and also participate in the writeshop insurance and equity	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	The partnership with Dr. Fisher (Reading University) will strengthen in 2017 through on-going publications on insurance and equity, and Dr. Fisher's active participation in the Galway writeshop. The link with Reading University also opens up 'new' avenues for future funding of the insurance work by virtue of taping into funding more readily available to UK universities. Despite budget cuts for 2017, the project leader has sought to ensure that Helen Greatrex's time on the project is not reduced as this would have a detrimental impact particularly on the work in Nigeria.

Partnerships overall over the last reporting period:

The partnership with IRI has been excellent. Helen Greatrex has taken responsibility for the impact assessment work in Nigeria, working closely with Rose Goslinga from Pula Advisers and also ex-IRI staff in the design of a randomized control trial. Helen has also led on the lesson learnt paper and has contributed to the work with Reading University on insurance and equity. With respect to the latter, Helen has drawn on her experience of gender from the CASCAID project. The new partnership with Dr. Eleanor Fisher (Reading University) had enriched the project by broadening the focus to include equity (including gender).

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
Country			Kenya
Country			Nigeria
Province	10.159	8.1339	Kaduna State
Province	11.7574	8.6601	Kano State

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
By 2019, the project will enable drought insurance to be delivered to an additional 700,000 farmers in East Africa and Nigeria. The insurance will be bundled with climate- adapted maize varieties and delivered to farmers through seed supply chains supported in East Africa and Nigeria by the Drought Tolerant Maize for Africa (DTMA) and the Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) Projects, In the case of Nigeria there are already plans for implementing index insurance pilots. The project will contribute to East Africa Flagship 2 MOG "Weather related Insurance products are designed and tested for drought-prone maize and bean-based farming systems in EA" and to the Flagship 2 overall MOG "Weather related Insurance products are designed, tested, and brought to scale with implementing partners". The project will also contribute to Flagship 2 work worldwide and to the 2024 Flagship 2 targets.

Annual progress towards outcome (end of 2016*): The research project will bring together some of the key players e.g. Swiss Re, Munich Re and the project leaders of the three bilateral projects - DTMA, SIMLESA and PABRA to explore ways forward for collaborative work on crop index insurance. The results of the impact assessment of ACRE along with the experimental games with farmers, and also the developed of CIAT-led work on developing new indices will be presented and discussed at these meetings/workshops.

Annual progress towards project outcome in the current reporting cycle (2016*): Budget meant that CIAT was dropped as a project partner and with it the PABRA bilateral project that focuses on beans. Emerging opportunities in Nigeria also meant that the project decided to switch activities from an impact assessment of ACRE to one that focuses on index insurance in Nigeria (please see other sections of this report e.g. the deliverables & outcome case study). In April 2016, CIMMYT and IRI organized a meeting in Nairobi that brought together representatives from the Drought Tolerant Maize for Africa Seed Scaling (DTMASS) project (a follow on project from DTMA) and SIMLESA to discuss how to work better with seed companies and insurance industry on linking index insurance with drought-tolerant maize seeds. Participants at the meeting also included Rose Goslinga (Pula Advisers), representatives from ACRE and the World Bank. The scaling expert from DTMASS also participated. CIMMYT staff from DTMASS and Jon Hellin have been in regular contact with major seed companies such as Kenya Seeds and Seed Co. to discuss further mainstreaming drought tolerant maize as part of their on-going index insurance schemes. In the case of Seed Co. the interest is related to work in other Sub-Saharan countries such as Nigeria where the CCAFs project is already working. We also worked closely with global and national insurers and reinsurers in February through the co-organisation of a workshop at Reading University linking the insurance industry to the remote sensing community (including Swiss Re and Hannover Re). This has allowed us to build further the relationships with them and to understand better their language and business models, providing a solid platform to scale index insurance. The recent link with Eleanor Fisher (Reading University) has enabled us to comprehensively tackle issues of social inclusion with lessons of relevance to the rest of CCAFS and other CRPs.

How communication and engagement activities have contributed to achieving your Project

outcomes:* Communication and engagement are the heart of this project; our aim is to understand/improve the networks and language between different stakeholders. We have engaged with a diverse variety of actors during 2016, including global reinsurers (SwissRe, HannoverRe), national insurance programmes (Pula, MANOBI, GAIP, ACRE), policy-makers (Nigeria), meteorologists (UCSB, Reading, IRI), social scientists (Reading, Galway, CCAFS gender meeting) and other CRPs (MAIZE). This has been achieved through reports, meetings, networking and media, leading to commercial insurance companies requesting CCAFS impact assessments and best practice guides (reaching over 100,000 farmers); co-CCAFS publications (Ireland write-shop) and new policy directions (COP, Nigeria, Bonn meeting).

Evidence documents of progress towards outcomes:*

https://marlo.cgiar.org/data/ccafs/projects//51/projectOutcome/Proposal_Insurance%20Conference_Bonn%20May%202017_Draft%2002.docx

Annual progress towards outcome (end of 2015): There is growing interest in the ability of crop index insurance to enhance resource-poor farmers' livelihoods by encouraging them to invest more in key inputs such as climate- adapted germplasm. In Sub-Saharan Africa, there is interest in the success of initiatives such as HARITA in Ethiopia and Kilimo Salama (now called ACRE) in Kenya. Dan Osgood (IRI, pers. comm.) has stressed the need for lessons to be learnt from these and other initiatives workwide. A synthesis of lessons learnt from initiatives worldwide would complement recently published work: Greatrex H, Hansen JW, Garvin S, Diro R, Blakeley S,Le Guen M, Rao KN, Osgood, DE. 2015. Scaling up index insurance for smallholder farmers: Recent evidence and insights. CCAFS Report No. 14 Copenhagen: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available online at: www.ccafs.cgiar.org The anticipated project outcome story is the result of the ex-post impact assessment. If Kilimo Salama is as successful as claimed, in terms of a crop index insurance initiative functioning on a largely commercial basis and bundling the insurance with farmers' increased used of (maize) germplasm, then anticipated behavioral changes include increased interest by insurers and re-insurers in the development and use of crop index insurance for resource-poor farmers in the developing world. This would be manifested by these key private sector players engaging more actively in the design process of new crop index insurance schemes in years 2-4 of the project and throughout working closely with the three main organizations involved in the project, namely CIMMYT, CIAT and IRI.

Annual progress towards outcome (end of 2017): The project will engage further with the international community via e.g. the World Bank to foster the expansion of crop index insurance to agricultural initiatives in regions beyond sub-Saharan Africa.

Annual progress towards outcome (end of 2018): The project will assess progress and functioning of crop index insurance in two of the three Sub-Saharan regional initiatives and revise the approach based on the evaluation.

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* The budget cuts that led to CIAT being dropped as a project partner clearly impacts on how the theory of change is manifested. The decision to switch the impact assessment from ACRE in Kenya to work in Nigeria has implications for the coming planning cycle.

4.2 CCAFS Outcomes

RP EA Outcome 2019: National Institutions, Donors and Relief Agencies are accessing and using research informed forecasting tools for timely and efficient food security decision-making and Academic, Government (e.g. Ministry of Ag.), and Development Organizations are developing and testing climate applications for agriculture to support scaling out and adoption of climate services to users (Farmer Organizations, CBOs, NGOs, agro-dealers, community radio).

Indicator #1: Number of regional, national, and/or sub-national initiatives incorporating research outputs to develop or improve major demand-driven, equitable, climate informed services that support rural communities

2019

Target value: 0

Cumulative target to date: 2

Target narrative: Drought Tolerant Maize for Africa (DTMA) and the Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) projects are developing and promoting farmer uptake of climate adapted germplasm bundled with crop index insurance The research project is designed to bring together actors in capacity building for index-insurance. The coming together of actors in proposal writing, the strength of compelling journal articles etc. will contribute to a mix of public and private sector actors coming together to design and implement index insurance schemes in in regions beyond Sub-Saharan Africa.

The expected annual gender and social inclusion contribution to this CCAFS outcome: CIMMYT and IRI are working with a social equity expert at the University of Reading to highlight the need for index insurance schemes to address issues of social equity rather than treating beneficiaries as a homogenous group

2015

Target value: 0

Cumulative target to date: 0

Target narrative: Crop index insurance is not new but the concept is not easy to understand and has tended to be overlooked by agricultural research for development initiatives as they develop and promote climate-adapted germplasm. The farmer experimental games to enhance farmers' understanding of crop index insurance and their willingness to engage in crop index insurance schemes will be presented to the project leaders of the three bilateral projects along with evidence that key private players such as the re-insurers are interesting in participating in crop index insurance initiatives.

The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 2 **Cumulative target to date:** 2 **Target achieved:** 2.0 **Target narrative:** The preliminary discussions with the two regional agricultural development initiatives will be deepened by testing the indices developed for Nigeria. This will enhance the initiative leaders' understanding of crop index insurance and their interest in discussing further the concept with the re-insurers and engaging in the design of suitable cop index insurance schemes for their respective bilateral projects. **Narrative for your achieved targets, including evidence:** We have worked closely with insurance stakeholders in Nigeria (especially Pula Consulting), who are expecting to reach several thousand farmers in 2017. This was supported by additional coordination with the Government of Nigeria about the roadmap document. A workshop in Nairobi in April brought together scientists from DTMASS and SIMLESA with insurance representatives. The CCAFS project is of course one of many supported by FP4: Climate Services and safety nets. The project also contributed to FP4 overall by working with James Hansen (FP4 leader) in the design and running of the Flagship meeting in Nyack in October 2016. **Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome:** 2017 led to new collaboration between this project and the University of Reading (along with parallel research by Helen Greatrex in CASCAID), which substantially advanced our understanding of social inclusion in index insurance. Key 2016 outputs (see deliverables) include a submitted journal article and two conference presentations at an international anthropology conference. These will also provide a baseline for the 2017 writeshop. Based on our social inclusion research, an insurer has requested we examine the social demographics of several thousand customers in a CCAFS Africa country in 2017 (discussions are on-going and the stakeholder has requested confidentiality for now). **The expected annual gender and social inclusion contribution to this CCAFS outcome:** CIMMYT, IRI and the University of Reading aim to publish a journal article on the importance of factoring in social inclusion when it comes to the implementation of any index insurance projects

Major Output groups:

- F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
Activity 2014-273: In terms of crop index insurance being a tool to facilitate and enhance farmer uptake of climate smart agricultural technologies such as drought adapted germplasm, the research will contribute to the Impact Pathways of Flagship 1 Activity 2014-274: The proposals for future index insurance work is not confined to East Africa and will very likely include Latin America, hence, contributing to the impact pathway for Flagship 2 in Latin America.

Collaborating with other CRPs

Maize
Description of collaboration: The bilateral projects that our project is working with are part of CRP Maize (i.e. DTMASS and SIMLESA). We presented results to the maize CRP through their CIMMYT/CIESIN project (see deliverables). Maize CRP provides bilateral funding to support our work (UC Davis' collaboration with DTMA on index insurance assessment).

4.4 Case Studies

Case Study #120

Title: Use of CCAFS products to build agricultural resilience through insurance in Nigeria

Year: 2016

Project(s): P51

Outcome Statement: 1. Research outputs used are i) roadmap document and ii) policy brief on scaling out index insurance in Nigeria. These are products of a two-year consultative process with Nigerian government and other actors . 2. Specific users are Federal Ministry of Agriculture and Rural Development (FMARD), Nigerian Meteorological Agency (NIMET), Nigerian Agricultural Insurance Corporation (NAIC) and Nigerian Insurers' Association (NIA), international insurers and re-insurers. 3. Outcome is Nigeria's government confirmed interest in launching index insurance initiatives in Nigeria.

Research Outputs: Two key policy documents provided to Nigeria's Federal Ministry of Agriculture and Rural Development (FMARD) following its request in September 2014 to CCAFS to work together on the design of a roadmap for evidence-based insurance development for Nigeria's farmers. 1. Hellin, J. and Hansen, J. 2016. "Building Agricultural Resilience through Insurance in Nigeria". CCAFS Info Note. 2. Hansen, J.W., Hellin, J. and Goslinga, R. Forthcoming. "A roadmap for evidence-based insurance development for Nigeria's farmers". CCAFS Working Paper 3. Report of Crop Cuts Work shop 25/10/2016, Pompaida, Kaduna State, Nigeria Research outputs 1&2 have already been uploaded in the deliverables section of the report so I am only uploading here the Workshop report.

Research Partners: CCAFS, CIMMYT and IRI (Columbia University)

Activities: During the UN Climate Summit, and the CGIAR Development Dialogs event at Columbia University, during Climate Week in New York in September 2014, the then Honourable Minister, Dr. Akinwumi Adesina, announced plans to expand insurance to 15 million smallholder farmers in Nigeria. Subsequent discussions between the Federal Ministry of Agriculture and Rural Development (FMARD) and (CCAFS) led to a request for CCAFS to organize a knowledge-sharing workshop in London from 27-28 January 2015. This was followed by a planning meeting in Zurich, 5-6 May 2015, hosted by SwissRe. Participants in the workshops included FMARD, the heads of the Nigerian and Indian Agricultural Insurance Corporations, CCAFS, SwissRe, German Corporation for International Cooperation (GIZ), Nigerian Meteorological Agency (NIMET), Nigerian Agricultural Insurance Corporation (NAIC), Nigerian Insurers' Association (NIA) and Pula Advisors. FMARD requested CCAFS to develop an evidence-based roadmap for developing insurance for Nigeria's farmers, in consultation with relevant organizations and experts.

Non-Research Partneres: FMARD, the heads of the Nigerian and Indian Agricultural Insurance Corporations, Swiss Re, German Corporation for International Cooperation (GIZ), Nigerian Meteorological Agency (NIMET), Nigerian Agricultural Insurance Corporation (NAIC), Nigerian Insurers' Association (NIA), Pula Advisers.

Output Users: Federal Ministry of Agriculture and Rural Development (FMARD), Nigerian Meteorological Agency (NIMET), Nigerian Agricultural Insurance Corporation (NAIC) and Nigerian Insurers' Association (NIA), international insurers and re-insurers.

Evidence Outcome: E-mails from former adviser to FMARD, Debisi Araba (now Africa Program leader for CIAT) who worked very closely with CCAFS on the roadmap document, confirming that the Minister of Agriculture wishes to launch officially the roadmap document. For reasons of confidentiality, the e-mail is not submitted.

Output Used: Outputs 1 & 2 (see above) were requested by FMARD in meeting with CCAFS during COP22 in Marrakech, Morocco. The CCAFS Africa Program Leader, Robert B. Zougmoré, subsequently sent the two documents to FMARD. CCAFS is waiting for FMARD to decidew how best to launch officially the roadmap document

References Case: 1. Hellin, J. and Hansen, J. 2016. "Building Agricultural Resilience through Insurance in Nigeria". CCAFS Info Note. 2. Hansen, J.W., Hellin, J. and Goslinga, R. Forthcoming. "A roadmap for evidence-based insurance development for Nigeria's farmers". CCAFS Working Paper. 3. Hellin J, Hansen J, Araba D. 2015. Evidence-Based Insurance Development for Nigeria's Farmers: Briefing paper for Nigerian Federal Ministry of Agriculture and Rural Development (FMARD)-CCAFS Knowledge-Sharing Workshop, London, 27-28 January 2015. CCAFS Brief. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Primary 2019 outcome indicator(s):

- Number of regional, national, and/or sub-national initiatives incorporating research outputs to develop or improve major demand-driven, equitable, climate informed services that support rural communities
- Increase in research-informed demand-driven investments in climate services for agriculture and food security decision-making (millions)

Link between outcome story and and the FP Outcome(s): <Not Defined>

Annex uploaded:
https://marlo.cgiar.org/data/ccafs/projects//51/caseStudy/Crop%20Cuts%20Workshop%20Pompaida,%20Kaduna%20state%20Oct%202016.pptx

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2019 contribution towards the selected MOG: It is anticipated that the scaling up of index insurance in Nigeria and the involvement of some of the same actors in East Africa initiatives will mean that DTMA and SIMLESA have included index insurance in their project activities and insurance products are being designed, tested and brought to scale

Brief`2019 plan of the gender and social inclusion dimension of the expected annual output: Lessons from the CASCAID project in Ghana, along with on-going work with a social equity specialist at Reading University, means that the gender and social inclusion dimensions of index insurance are fully captured in the design and implementation of index insurance schemes in Sub-Saharan Africa

Major Output groups - 2016

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: CCAFS work with the Nigerian government in the implementation of the index insurance pilots in Nigeria

Brief summary of your actual 2016 contribution towards the selected MOG: Coordinated with the Nigerian government to further develop insurnace policy (briefing note, meetings) Funded a workshop to assess how insurance might be packaged with inputs in northern Nigeria Designed an impact assessment of a large scale insurance programme in Nigeria to allow evidence based policy making.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Lessons from the CCAFS-supported research in Ghana on (Assessing the impact of agricultural insurance on gender dynamics In Northern Ghana) will be factored into the implementation of the pilots in Nigeria

Summary of the gender and social inclusion dimension of the 2016 outputs: The design for the impact assessment includes many of the lessons and tools developed in CASCAID. It will pay special attention to the needs of disadvantaged groups within the framework allowed by the RCT. We are also hoping to assess the gender balance of all customers in the assessed programme.

Major Output groups - 2015

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: CCAFS work with the Nigerian government has reached the point where GIZ are ready to support the implementation of index insurance pilots in Nigeria based on both a weather-based and area-yield index insurance

Brief summary of your actual 2015 contribution towards the selected MOG: The project facilitated the design of the pilots via workshops on designing and implementing index insurance in Nigeria in London (January 2015) and Zurich (May 2015). The latter brought in Rose Goslinga, former CEO of Kilimo Salama (now ACRE). She is involved in the design and implementation of the pilots

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: Lessons from the CCAFS-supported research in Ghana on (Assessing the impact of agricultural insurance on gender dynamics In Northern Ghana) will be factored into the design of the pilots in Nigeria.

Summary of the gender and social inclusion dimension of the 2015 outputs: To date the project has not been able to link the lessons from Ghana with the design of the pilots in Nigeria

Major Output groups - 2014

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D2786 - Cultures of Risk and Security Farmers - Insurance Innovation & Equity

Main Information

Type: Outreach products

Subtype: Presentation/Poster

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Cultures of Risk and Security Farmers - Insurance Innovation & Equity
Description / Abstract: Power point presentation at conference entitled "Anthropology, Weather and Climate Change". British Museum, London 27-29 May 2016
Publication / Creation date: 2016-05-01
Language: English
Country: United Kingdom
Keywords: Social equity; index insurance; farmers; insurance industry
Citation: Fisher, E., Hellin, J. and Greatrex, H. 2016. Cultures of Risk and Security Farmers - Insurance Innovation & Equity
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Fisher - Eleanor
- Hellin - Jon
- Greatrex - Helen

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Cultures%20of%20Risk%20and%20Security%20Farmers%20-%20Insurance%20Innovation%20&%20Equity.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible
University of Reading	Fisher, Eleanor<e.fisher@reading.ac.uk>	Other
Columbia University	Greatrex, Helen<greatrex@iri.columbia.edu>	Other

D2787 - Experts Launch Action Plan to Help African Agriculture Adapt to Climate Change

Main Information

Type: Outreach products

Subtype: Social Media Output

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://ccafs.cgiar.org/news/media-centre/press-releases/experts-launch-action-plan-help-african-agriculture-adapt-climate

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Experts Launch Action Plan to Help African Agriculture Adapt to Climate Change

Description / Abstract: MARRAKECH, November 14 – Leading scientists and policymakers have come together at the COP22 climate talks in Marrakech to determine priorities for collective action that will help African agriculture to build resilience to climate change and feed the chronically food insecure continent. “Six of the 10 countries most affected by climate change are in Africa yet Africa is responsible for only four per cent of greenhouse gas emissions,” said Bruce Campbell of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), which co-hosted the event. “Moreover, African countries only receive five per cent of climate funding. This event was a crucial step towards a mutual goal: finding ways to adapt to climate change and finding the funds to make it happen.” 98% of African countries have pledged to include agriculture adaptation in their climate change strategies, yet progress at a global level on agriculture has stalled at COP22. Discussions on how to include agriculture as part of the climate negotiations has been delayed until May 2017, making action at a regional level all the more urgent. Representatives from the government of Morocco joined researchers, entrepreneurs and farmers from across Africa to discuss the most promising adaptation solutions for the continent. With COP22 deemed the “COP of Action” following the entry into force of the Paris Agreement, the event focussed on how to implement an ambitious new AAA initiative launched by the Moroccan government, that seeks to mobilise $30 billion for Africa

to transform and adapt its agriculture to a changing climate
Publication / Creation date: 2016-11-01
Language: English
Country: Global
Keywords: Climate change adaptation
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible

D2788 - Jon Hellin – Crop-index insurance for smallholder farmers

Main Information

Type: Outreach products

Subtype: Social Media Output

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.youtube.com/watch?v=CJDpP8D_sF4

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Jon Hellin – Crop-index insurance for smallholder farmers
Description / Abstract: You tube of index insurance, risk and farmer uptake of maize seed
Publication / Creation date: 2016-11-01
Language: English
Country: <Not Defined>
Keywords: Index insurance, farmers, climate change
Citation: Jon Hellin – Crop-index insurance for smallholder farmers
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Hellin - Jon

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible

D2789 - Interdisciplinary entanglements in index insurance

Main Information

Type: Outreach products

Subtype: Presentation/Poster

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Interdisciplinary entanglements in index insurance
Description / Abstract: Power point presentation at conference entitled "Anthropology, Weather and Climate Change". British Museum, London 27-29 May 2016
Publication / Creation date: 2016-05-01
Language: English
Country: United Kingdom
Keywords: Index insurance, risk, farmers
Citation: Greatrex, H., Alo, S., Rahel, D., Hellin, J. and Fisher, E
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Greatrex - Helen
- Alo - Susana
- Rahel - Diro
- Hellin - Jon
- Fisher - Eleanor

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Interdisciplinary%20entanglements%20in%20index%20insurance.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
IRI - International Research Institute for Climate and Society	Greatrex, Helen <greatrex@iri.columbia.edu>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan<j.hellin@cgiar.org>	Other
University of Reading	Fisher, Eleanor<e.fisher@reading.ac.uk>	Other

D1414 - Journal article in the Bulletin of the American Meteorological society

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://journals.ametsoc.org/doi/full/10.1175/BAMS-D-16-0148.1

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Incorporating Satellite Data Into Weather Index Insurance
Description / Abstract: Twenty-three people from six countries came together to discuss how drought insurance based on remotely sensed data can reduce the impact of weather shocks on some of the poorest people in the world. Participants were drawn from financial and agricultural sectors, nongovernmental and governmental organizations, and universities. This article describes that meeting. It also allowed this CCAFS project to examine the language used within insruance
Publication / Creation date: 2016-06-016
Language: English
Country: Global
Keywords: insurnace, language, stakeholder engagement
Citation: Black, E., Greatrex, H., Young, M., & Maidment, R. (2016). Incorporating Satellite Data Into Weather Index Insurance. Bulletin of the American Meteorological Society, 97(10), ES203-ES206
Handle: http://journals.ametsoc.org/doi/full/10.1175/BAMS-D-16-0148.1
DOI: http://dx.doi.org/10.1175/BAMS-D-16-0148.1
Creator / Authors: <Not Defined>

Publication Metadata

Volume: 97
Issue: 10
Pages: ES203-ES206.
Journal/Publisher name: Bulletin of the American Meteorological Society
Indicators for journal articles: ● This journal article is an ISI publication
● This article have a co-author based in an Earth System Science-related academic department

Publication acknowledge: Yes
Flagships contribution:

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
IRI - International Research Institute for Climate and Society	Greatrex, Helen <greatrex@iri.columbia.edu>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan<j.hellin@cgiar.org>	Other

D2790 - Building Agricultural Resilience through Insurance in Nigeria

Main Information

Type: Reports and other publications
Subtype: Policy brief/policy note/briefing paper
Status: Complete
Year of expected completion: 2016
New expected year: <Not Defined>
Cross-cutting dimension:
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Not Disseminated
License adopted: No

Deliverable Metadata

Disseminated title: Building Agricultural Resilience through Insurance in Nigeria
Description / Abstract: A CCAFS Infonote for Nigerian government
Publication / Creation date: 2016-12-01
Language: English
Country: Nigeria
Keywords: <Not Defined>
Citation: Hellin, J. and Hansen, J. Draft. Building Agricultural Resilience through Insurance in Nigeria
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:
- Hellin - Jon
- Hansen - Jim

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Policy%20brief_DRAFT.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan<j.hellin@cgiar.org>	Other

D2792 - CIMMYT/CIESIN public report and seminar linking with project findings (MAIZE CRP)

Main Information

Type: Reports and other publications

Subtype: Conference paper / Seminar paper

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://sites.google.com/site/maizeintensification/research/the-impact-of-pixel-scale-satellite-rainfall-uncertainty-on-modeled-crop-yield-and-agricultural-development-applications

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: The impact of pixel scale satellite rainfall uncertainty on modeled crop yield and agricultural development applications

Description / Abstract: This paper was presented to the CIMMYT/CIESIN project "Sustainable Development Goals and Data Needs for Maize Intensification Plans" (https://sites.google.com/site/maizeintensification/home). Dr Greatrex also presented a public webinar on the topic. It discussed some of the alternate datasets in use for agronomic research, including both remotely sensed data and social data. It drew on the social data findings of this project.

Publication / Creation date: 2016-10-01

Language: English

Country: Global

Keywords: Satellites, crop modelling

Citation: Greatrex, H. "The impact of pixel scale satellite rainfall uncertainty on modeled crop yield and agricultural development applications", presented to the Sustainable Development Goals and Data Needs for Maize Intensification Plans project on 25 Oct 2016, published by CIMMYT and accessible at https://sites.google.com/site/maizeintensification/research/the-impact-of-pixel-scale-satellite-rainfall-uncertainty-on-modeled-crop-yield-and-agricultural-development-applications

Handle: https://sites.google.com/site/maizeintensification/research/the-impact-of-pixel-scale-satellite-rainfall-uncertainty-on-modeled-crop-yield-and-agricultural-development-applications

DOI: <Not Defined>

Creator / Authors:

- Helen - Greatrex<orcid.org/0000-0002-1047-9276>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
IRI - International Research Institute for Climate and Society	Greatrex, Helen <greatrex@iri.columbia.edu>	Responsible

D2794 - Index insurance, risk mitigation and increased farm productivity

Main Information

Type: Reports and other publications

Subtype: Research workshop report

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Diagnostics/analysis to understand gender issues
- Development of innovations/ interventions/ policies with explicit gender targeting

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Intellectual Property Rights (confidential information)
License adopted: No

Deliverable Metadata

Disseminated title: Index insurance, risk mitigation and increased farm productivity
Description / Abstract: A report of a workshop held in Kenya towards the end of April 2016 that brought together CIMMYT colleagues working on index insurance and linked to SIMLESA, DTMASS (Drought Tolerant Maize for Africa Seed Scaling (DTMASS), was born out of the progress made by DTMA and other CIMMYT-Africa maize projects between 2007 and 2014), Helen Greatrex from IRI and key external partners such as ACRE, Pula Advisers, World Bank
Publication / Creation date: 2016-04-01
Language: English
Country: Kenya
Keywords: Index insurance; East Africa
Citation: Hellin, J. and Greatrex. H. 2016. Report on a workshop entitled "Index insurance, risk mitigation and increased farm productivity". Nairobi 26-28 April. 2016
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- hellin - Jon
- Greatrex - Helen

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Report%20Weather%20Index%20Insurance%20Meeting%2026-28%20April%202016%20Nairobi%20%2023-DEC-16JH.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible
IRI - International Research Institute for Climate and Society	Greatrex, Helen<greatrex@iri.columbia.edu>	Other

D2797 - Index insurance and climate risk management: questions of equity

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Index insurance and climate risk management: questions of equity
Description / Abstract: Index insurance can facilitate farmer adoption of climate-smart agriculture, enabling farmers to manage climate-related risk while reducing poverty and fostering growth. We suggest more attention needs to be directed to issues of equity if index insurance is to contribute to socially-sustainable and poverty reducing climate change adaptation and mitigation. This requires debate on how insurance gains are allocated and costs and benefits distributed across society. Taking into account opportunities for greater equality shifts the focus from agricultural systems in transition per se to systems that also incorporate social transformation. To facilitate analysis, an equity assessment framework for index insurance is presented and its relevance illustrated with lessons from the CGIAR's Research Program on Climate Change, Agriculture and Food Security (CCAFS).
Publication / Creation date: 2016-12-01
Language: English
Country: United Kingdom
Keywords: climate change adaptation and mitigation; index insurance; equity; inequality; agriculture
Citation: Fisher, E., Hellin, J. and Greatrex, H. Submitted. Index insurance and climate risk management: questions of equity
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Fisher - Eleanor
- Hellin - Jon
- Greatrex - Helen

Publication Metadata

Volume:
Issue:
Pages:
Journal/Publisher name: Developmen Policy Review
Indicators for journal articles: ● This journal article is an ISI publication

Publication acknowledge: Yes
Flagships contribution: ● CCAFS - F4 (BEFORE F2 - JAMES)

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible
University of Reading	Fisher, Eleanor<e.fisher@reading.ac.uk>	Other
IRI - International Research Institute for Climate and Society	Greatrex, Helen<greatrex@iri.columbia.edu>	Other

D2925 - Workshop report on crop cuts and area yield insurance for the Nigerian insurnace industry

Main Information

Type: Reports and other publications
Subtype: Research workshop report
Status: Complete
Year of expected completion: 2016
New expected year: <Not Defined>
Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Not Disseminated
License adopted: No

Deliverable Metadata

Disseminated title: Area yield insurance and fertilizer - Pompaida, Kaduna State, Nigeria.
Description / Abstract: Goal of the work shop: Show case methodology of data collection; box marking Harvesting Weight measurement Ensure participants appreciate area yield index insurance and agriculture insurance as a whole Practical experience of methodology of data collection for area yield index Provide room to criticize area yield index Bring together key agriculture stakeholders in Nigeria
Publication / Creation date: 2016-10-01
Language: English
Country: Nigeria
Keywords: <Not Defined>
Citation: Goslina, R, " Area yield insurance and fertilizer - Pompaida, Kaduna State, Nigeria.", internal workshop report, 2016
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Crop%20Cuts%20Workshop%20Pompaida,%20Kaduna%20state%20Oct%202016.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible

D369 - Update report on Nigeria impact assessment

Main Information

Type: Governance, Administration & Management

Subtype: Management report

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender

Gender level(s):

- Monitoring/impact assessment of gender outcomes of research/innovations/interventions/polices
- Collection of sex-disaggregated data
- Analysis of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No

Open access: No

Open access restriction: Not Disseminated

License adopted: No

Deliverable Metadata

Disseminated title: Assessing the impact of a operational insurance programme on fertilizer use: Current summary of CCAFS fieldwork in Nigeria

Description / Abstract: This report constitutes a current summary of activities in Nigeria within our CCAFS project. In particular, this report provides an update on the design of a randomised controlled trial to assess the complex impact of a bundled fertilizer-insurance area yield product, which aims to insure 1 million bags of fertilizer in the year 2017. It describes current progress, the experiment design, data already collected and the technical calculations behind the experiment

Publication / Creation date: 2016-12-01

Language: English

Country: Nigeria

Keywords: Impact assessment, area yield, insurnace, index insurance

Citation: Greatrex, H, Hellin, J, Goslinga, R, Vasilaky, K, "Assessing the impact of a operational insurance programme on fertilizer use: Current summary of CCAFS fieldwork in Nigeria", CCAFS Internal update report

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors:

- Greatrex - Helen
- Hellin - Jon

- Goslinga - Rose
- Vasilaky - Katya

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Nigeria%202016%20Summary%20Document.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
IRI - International Research Institute for Climate and Society	Greatrex, Helen <greatrex@iri.columbia.edu>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan<j.hellin@cgiar.org>	Other

D370 - Roadmap document for scaling of index index insurance submitted to Federal Goverment of Nigeria

Main Information

Type: Reports and other publications

Subtype: Discussion paper/Working paper/White paper

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender

Gender level(s):

- Diagnostics/analysis to understand gender issues

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Not Disseminated
License adopted: No

Deliverable Metadata

Disseminated title: A Roadmap for Evidence-Based Insurance Development for Nigeria's Farmers
Description / Abstract: In 2014, Nigeria's Federal Ministry of Agriculture and Rural Development (FMARD) proposed a major expansion of agricultural insurance in the context of other reforms to the agricultural sector, and as part of the implementation of its National Agricultural Resilience Framework (NARF). This report is designed to inform development of inclusive insurance for Nigeria's agriculture sector, and is offered as a contribution to the NARF. It is an outcome of a consultative process that began in September 2014 between FMARD and the CGIAR research program on Climate Change, Agriculture and Food Security (CCAFS). By overcoming the problems of moral hazard, adverse selection, and resulting high transaction costs and processing delays that have plagued indemnity-based agricultural insurance, index-based insurance makes it feasible to insure millions of smallholder farmers. Well-designed index insurance can achieve specific risk objectives such as protecting farmers' livelihoods in the face of major climate shocks, and promoting farmers' livelihoods by overcoming barriers to adoption of improved agricultural technologies and practices, and access to market opportunities. Reviews of index-based agricultural insurance initiatives have identified several success factors that are relevant to the situation in Nigeria. First, successful initiatives have been designed to unlock particular opportunities for farmers that were previously constrained by particular risks. Second, initiatives are most successful when they are driven by demand and responsive to farmer input. Third, successful initiatives have invested in the capacity of a range of local stakeholders. Fourth, investments in data systems, and in science-based index development, have helped address the challenges of data poverty and basis risk. Fifth, successful index insurance requires an enabling

regulatory environment. Finally, successful initiatives involve multi-stakeholder partnerships, and often public-private partnerships. A strategy for expanding insurance for Nigeria's smallholder farmers must address challenges that include: limited and asymmetric information; crowding out by post-disaster relief efforts; limited access to reinsurance markets; lack of insurance culture; and inadequate regulatory environments. The development of effective market-based agricultural insurance, requires government support in five key areas: data systems; awareness and capacity building; facilitating international risk pooling; "smart" subsidies; and an enabling policy environment. Three immediate priorities are identified: (a) creating a regulatory environment that makes it attractive for insurance companies to enter the market; (b) developing a public-private partnership that incentivizes and supports companies to develop innovative products and services for the agriculture sector; and (c) progressively expand implementation through well-designed pilots, evaluation and learning processes. The organizations that have been involved or consulted in the process leading to this report offer relevant expertise.

Publication / Creation date: 2016-11-01
Language: English
Country: Nigeria
Keywords: Nigeria; index insurance; farmers
Citation: Hansen, J., Hellin, J and Goslinga, R. Draft. A Roadmap for Evidence-Based Insurance Development for Nigeria's Farmers
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Hansen - Jim
- Hellin - Jon
- Goslinga - Rose

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Nigeria%20insurance%20roadmap%20DRAFT%20Nov2016.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible

D2811 - Index insurance and farmer adoption of climate-smart agricultural practices

Main Information

Type: Outreach products

Subtype: Presentation/Poster

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- N/A

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: Index insurance and farmer adoption of climate-smart agricultural practices
Description / Abstract: Presentation at Adaptation of African Agriculture event in Marrakech, Morocco during COP 22
Publication / Creation date: 2016-11-01
Language: English
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors:

- Hellin - Jon

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//51/deliverableDataSharing/Presentation%20template_AAA%20event%2012-NOV-16%20J.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Hellin, Jonathan <j.hellin@cgiar.org>	Responsible

5.3 Project Highlights

Project highlight 200	
Title: Index insurance and climate risk management: questions of equity	
Author: Fisher, E., Hellin, J. and Greatrex, H.	**Subject:** Equity, index insurance
Publisher: Submitted to the Journal 'Development Policy Review"	**Year reported:** 2016
Project highlights types: ● Gender and social inclusion ● Successful communications ● Capacity enhancement ● Policy engagement	**Is global:** Yes
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Climate change adaptation and mitigation; index insurance; equity; inequality; agriculture	**Countries:**

Highlight description: In our article we suggest that more attention needs to be directed to issues of equity if index insurance is to be considered a socially sustainable climate change adaptation and mitigation tool tailored to the needs of the poor. Considering index insurance from an equity perspective, raises the moral proposition that farmers ought not to pay an insurance premium to adapt to climate risks they have not created. We do not dismiss this proposition. Rather, operating as we do on projects and research within countries where index insurance is being rolled out to millions of farmers (often combined with other products and services that farmers may or may not be paying for themselves), we seek to stimulate discussion over whether and how equity can be generated within the context of existing policy responses and practical actions. For us, this opens up opportunities to ensure climate change adaptation and mitigation is linked to more equitable social transformation. At the very least we argue there is a need to avoid worsening existing inequalities. We recognize that linking index insurance to questions of equity risks bogging climate risk management down in the same politics of resource access and distribution that has impeded social policy for decades, nevertheless we suggest that failing to pay attention to issues of equity may result in distortions and inefficiencies that threaten the sustainability of climate adaptation in the long-run. Ignoring questions of equity is not only a moral issue but also a practical concern, given a significant body of evidence suggesting that disparities rising out of inequality can impede development outcomes both now and in the future. There is also growing evidence that a focus on the most marginal sections of society might well lead to higher benefit - cost ratios.

Introduction / Objectives: Much of the literature on index insurance addresses the virtues of the product and difficulties in scaling it up beyond the many pilots that have been implemented. There is limited consideration either of how farmers' access to index insurance interfaces with inequalities already present in farming populations or of the differential impact of index insurance schemes upon an already heterogeneous rural population. Moreover generating development benefits that extend beyond agricultural risk management to address rural poverty, does require discussion of whether and how this can or should be done in ways that stimulate socially-equitable outcomes. Our article addresses these issues.

Results: Index insurance can enhance farmers' resilience to climate-related shocks. Much of the

literature on index insurance discusses the virtues of the product, design challenges, and/or difficulties in scaling it up beyond the many pilots that have been implemented. There is, in contrast, limited consideration either of how farmers' access to index insurance interfaces with inequalities already present in farming populations and/or how these inequalities contribute to the differential impact of index insurance initiatives upon heterogeneous rural populations. A focus on equity is an opportunity to consider how index insurance can build greater equality e.g. gender benefits. The authors have suggested that more attention be directed at issues of equity if index insurance is to contribute to socially-sustainable climate change adaptation and mitigation tailored to the needs of the poor. Focusing on equity provides a mechanism for identifying avoidable faults that either fuel inequities and/or reproduce inequality within a farming population where index insurance is being promoted. The authors have developed an equity assessment framework for index insurance and one of the results of the submitted article is the opportunity to explore the issue further during a CCAFS write-shop in Galway. Ireland in April 2017. The Galway write-shop is an opportunity to develop further the conceptual framework and incorporate concrete examples of the ex-ante and ex-post impact of index insurance in terms of equity. The product of the write-shop will be a journal article co-authored by all those who contribute to the writing process. The write-shop article, in turn, lays the foundation for a third article which can identify the metrics to assess issues of equity in index-based agricultural insurance. For now the priority is the second article. Eleanor Fisher has also been invited to present individually at the Galway write-shop. Her topic is to 'Framing Equity for Climate Smart Agriculture'

Partners: The publication is the result of a fortuitous partnership between the CCAFS project and Dr. Eleanor Fisher at the University of Reading in the UK. Dr. Fisher has conducted much research on the link between cash transfers and social equity and the CCAFS project has found common ground with her with respect to index insurance and equity. While the rest of the CCAFS cannot be classified as 'partners' it is important to point out that the work on social equity is important to all projects supported by CCAFS (not to mention the other CRPs). CCAFS and the other CRP proposals for Phase II are peppered with references to equity but it is not clearly spelt out what is meant by this. The same applies to 'youth'. These terms need unpacking, as referenced in the CCAFS gender workshop (Cali, Oct 2016) which was attended by Helen Greatrex. Social equity is much more than gender but there is confusion as to what the term means and how it can be best applied in CCAFS. CCAFS Phase II proposal for FP4 contains text such as "all activities related to rural climate information or insurance services will assess and proactively target the needs and constraints of female and young farmers". The dangers is that researchers and research managers may pay lip-service to the issue of equity and then find it very difficult to report to donors on what we/they have actually done. Jon Hellin and Helen Greatrex raised this issue at the then FP2 now FP4 meeting in Nyack in October. We are grateful to CCAFS for the opportunity to explore the issues of social equity further during the Galway write-shop in April, 2017 and believe strongly that Eleanor Fisher's participation as both a speaker and write-shop participant will benefit all projects.

Links / Sources for further information: Eleanor Fisher (University of Reading) and Jon Hellin (CIMMYT) made a presentation on index insurance, risk and equity at an international conference on Anthropology, Weather and Climate Change at the British Museum in London in May 2016 https://www.therai.org.uk/conferences/anthropology-weather-and-climate-change

6. Activities

A137 - Design and evaluation of index insurance based on technical requirements and acceptability to targeted farmers

Description: Use information on climate risk from local to regional scales in smallholder farming systems to support the design and assessment of Nigerian index insurance products from policy to farm. Create best practice guides or basis risk assessment as appropriate.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Hellin, Jonathan <j.hellin@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: 1. We funded a workshop bringing together the fertilizer industry and insurers to assess how insurance might be bundled with fertilizer in Nigeria - and the properties of the index that would allow this (area yield). 2. We closely worked with the Nigerian insurance programme on the technical details of their index, resulting in them requesting support in their area-yield index design in 2018 (for example in the necessary level of sampling and a "best practice" guide for crop cuts). 3. We brought representatives of Nigerian insurance programmes (Rose Goslinga) to a workshop specifically discussing index design (the links between satellite and indices), resulting in concrete new collaborations.

Deliverables in this activity:

- D1414: Journal article in the Bulletin of the American Meteorological society
- D2790: Building Agricultural Resilience through Insurance in Nigeria
- D369: Update report on Nigeria impact assessment
- D370: Roadmap document for scaling of index index insurance submitted to Federal Goverment of Nigeria
- D755: Draft manuscript on business models and lessons learnt in index insurance
- D2925: Workshop report on crop cuts and area yield insurance for the Nigerian insurnace industry

A270 - Exploration of feasibility of linking crop index insurance schemes to on-going bilateral research projects

Description: CIMMYT and IRI wish to link index insurance initiatives with the drought tolerant maize scaling project (DTMASS) supported by USAID and the SIMLESA project. DTMASS (a major bilateral project has huge potential to be a key next user. In April 2016, the project held a meeting in Nairobi, Kenya with DTMASS and SIMLESA staff and other key stakeholders such as the much publicized ACRE project, to look at how best to move ahead on 'bundling' index insurance with drought tolerant maize varieties that have already been developed. Next steps are to link DTMASS with the key insurers and re-insurers and seed companies, hence, bringing together many of the players needed to scale up crop index insurance. Judicious work between the research project and DTMASS (and other actors) has the potential to significantly increase the use of crop index insurance schemes in East Africa. The work will be continued in 2017.

Start date: Jan 2015 **End date:** Jan 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Hellin, Jonathan <j.hellin@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: The April workshop was a very useful stepping stone in bringing the necessary actors together. Prior and subsequent to the April workshop, the CCAFS project has had conversations with two large seed companies - Kenya Seed and Seed Co - about the possibility of feeding more drought tolerant germplasm into their on-going breeding and seed production activities. Both companies are already working with index insurance initiatives in Kenya (the 21-day re-planting guarantee that has been pioneered by ACRE). The proposed Bonn meeting in May 2017 is an opportunity to link with the insurers and re-insurers and to look jointly for mechanisms e.g. funding to scale out index insurance.

Deliverables in this activity:

- D762: Proposal for new funding for index insurance scale out in SSA and/or Latin America
- D2794: Index insurance, risk mitigation and increased farm productivity
- D2787: Experts Launch Action Plan to Help African Agriculture Adapt to Climate Change
- D2788: Jon Hellin – Crop-index insurance for smallholder farmers
- D2811: Index insurance and farmer adoption of climate-smart agricultural practices
- D2789: Interdisciplinary entanglements in index insurance
- D2786: Cultures of Risk and Security Farmers - Insurance Innovation & Equity

A273 - A document capturing lessons leant from existing crop index insurance targeted at resource-poor farmers

Description: There are few rigorous documents that capture lessons from on-going, index insurance initiatives that target resource-poor farmers. There are exceptions, for example Kilimo Salama (now called ACRE) in Kenya and HARITA in Ethiopia. IRI and CIMMYT will also analyze other index insurance initiatives (both weather based and area yield) to cover more comprehensively the diversity of initiatives being practiced around the world.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: IRI - International Research Institute for Climate and Society Greatrex, Helen <greatrex@iri.columbia.edu>
Status: On-going

Overall activity or progress made during this cycle: We worked with stakeholders and scientists in 2016 to clarify the specific aims, audience and message of this document. The specific aim of the document is now to look at the added value that insurnace might bring and the complex, varied business models it inspires. There are many different ways that an insurance programme can scale sustainably, we aim to capture these through techniques such as value mapping. A preliminary draft of this report has been written and is being shared with authors. We hope that this will be submitted before the Bonn meeting in 2017 to a peer reviewed journal.

Deliverables in this activity:

- D369: Update report on Nigeria impact assessment
- D755: Draft manuscript on business models and lessons learnt in index insurance

A274 - External funding proposal(s) developed for future crop index insurance research

Description: There is considerable interest from the public and private sector in: i) Index insurance as a tool for Climate Risk Management; ii) scaling up index insurance and boosting private sector participation and iii) local implementation and impact evaluation. The CCAFS-supported project will submit a proposal during the lifetime of the project designed to further research in crop index insurance for resource-poor farmers. The proposals will be developed with key public and private sector actors taking advantage of IRI's networks and also recently-established links that CIMMYT has made with the Global Index Insurance Facility (GIIF). One of the activities is to have a proposal writing workshop bringing together CIMMYT, IRI and other actors. Project partners will take advantage of these meetings to combine them with a writers' workshop designed to generate a journal article on aspects of the crop index insurance.

Start date: Jan 2017 **End date:** Oct 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Hellin, Jonathan <j.hellin@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: The April 2016 workshop brought together representatives from DTMASS and SIMLESA with CIMMYT staff and others working in index insurance. We will share ideas from that workshop with the insurance community during the proposed Bonn meeting in May 2017, as part of our mission to advance finding funding for future index insurance research. Future research is also linked to initiatives in Nigeria where the work with Pula Advisers and the expressed interest of the Nigerian government in index insurance provides opportunities for funding for future research on index insurance. As part of this there have been preliminary discussions with donors such as the Nigerian government and the Gates foundation.

Deliverables in this activity:

- D370: Roadmap document for scaling of index index insurance submitted to Federal Goverment of Nigeria
- D2790: Building Agricultural Resilience through Insurance in Nigeria
- D2794: Index insurance, risk mitigation and increased farm productivity

A673 - Randomized control trial in Nigeria

Description: We propose to continue the randomised controlled trial developed in 2016 by CIMMYT, IRI , Pula consulting and Dr Katya Vasilaky. The aim of this trial will be to assess the impact of the new insurance program in Nigeria being developed by Pula Consulting and NIRSAL (Golden Rice). Over 150,000 bags of fertilizer are likely to be insured. This will assess both the complex reasons farmers use to take (or avoid) index insurnace, plus the impact of a bundled insurance-fertilizer product on input use and yields. It will also be able to assess the potential to include other CCAFS products/initiatives at scale in such a bundle.

Start date: Jan 2017 **End date:** Jun 2018

Activity leader: IRI - International Research Institute for Climate and Society Greatrex, Helen <greatrex@iri.columbia.edu>
Status: On-going

Overall activity or progress made during this cycle: The impact assessment has been designed, initial data has been gathered and it is ready to be rolled out in Kaduna state in 2017. We aim to reach 4000 farmers (at least 150,000 bags of fertilizer will be insured), with 550 having a detailed survey. Initial power calculations suggest that we should be able to detect a 20% change in yields. The trial will also provide information on which farmers purchase a "fertilizer-insurnace voucher bundle", which actually choose to register for the insurance and their reasons for doing so (or not). We will also assess the gender dimensions of this issue. We have included a full update report as a deliverable. As part of this process we also had the opportunity to assess the business model being used in this case, which has greatly added to our peer reviewed manuscript on added value within index insurance.

Deliverables in this activity:

- D755: Draft manuscript on business models and lessons learnt in index insurance
- D369: Update report on Nigeria impact assessment

A745 - Index insurance and social equity

Description: Much of the literature on index insurance addresses the virtues of the product and difficulties in scaling it up beyond the many pilots that have been implemented. There is limited consideration either of how farmers' access to index insurance interfaces with inequalities already present in farming populations or of the differential impact of index insurance schemes upon an already heterogeneous rural population. Moreover generating development benefits that extend beyond agricultural risk management to address rural poverty, does require discussion of whether and how this can or should be done in ways that stimulate socially-equitable outcomes. The CCAFS project has linked with Dr. Eleanor Fisher to explore further the link between index insurance and equity.

Start date: May 2016 **End date:** Jun 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Hellin, Jonathan <j.hellin@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: Jon Hellin, Eleanor Fisher and Helen Greatrex have submitted a journal paper and presented at a conference (see associated deliverables) on the issue of index insurance and social equity . The authors have suggested that more attention be directed at issues of equity if index insurance is to contribute to socially-sustainable climate change adaptation and mitigation tailored to the needs of the poor. Focusing on equity provides a mechanism for identifying avoidable faults that either fuel inequities and/or reproduce inequality within a farming population where index insurance is being promoted. In the submitted journal paper, the authors have developed an equity assessment framework for index insurance and one of the results of the submitted article is the opportunity to explore the issue further during the CCAFS write-shop in Galway, Ireland in April 2017 where the three authors will be leading a write shop topic on insurance and equity.

Deliverables in this activity:

- D2786: Cultures of Risk and Security Farmers - Insurance Innovation & Equity
- D2797: Index insurance and climate risk management: questions of equity
- D2789: Interdisciplinary entanglements in index insurance

7. Leverages

No leverages added

Title: Recommendation domains, incentives and institutions for equitable local adaptation planning at sub-national level and scaling-up CSAPs in wheat &maize systems

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2018	RP SAs	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>

Funding source types	Status	Lead Organization	Project leader
W1/W2, Bilateral	Complete	CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo - Mexico	Jat, ML <m.jat@cgiar.org>

Project is working on

Flaship(s)
F2 (before F1 - Andy): Climate-Smart Technologies and Practices

Region(s)
SAs: South Asia

Project summary

To respond the food security challenges, the climate smart agricultural (CSA) interventions & policy instruments that provide resilience to climatic variability, sustainably enhance yield/farm profits need to be targeted/mainstreamed into local development plans. CSAPs at plot-scale revealed significant benefits for food security and adaptive capacity and which have been very encouraging at farmer and policy level. However, large-scale adoption of CSAPs needs mainstreaming strategy for local level targeting and implementing CSAPs. Project will focus on developing local adaptation planning and business cases for scaling CSAPs. The project will also aim at an iterative process to scan, define and address opportunities and barriers for developing, piloting and scaling business cases for CSAPs. Innovation platforms' will be established around CSAPs to validate climate smart business cases. Robust science-based evidences on CSAPs and enhanced capacity will feed into sub-national policy that influences the trajectories of farmer households towards better adaptation to climate change.

2. Partners

Partner #1 (Leader)

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Jat, ML <m.jat@cgiar.org>	Activity 2014-258 *Partner*. Contributing to the development and validation of CSA business models in Punjab, Haryana, Bihar & and contribute to the other locations. Organize and engage women groups/cooperatives for development and validation of CSAP business models.	New Delhi, India
Partner	Mittal, Surabhi <s.mittal@cgiar.org>	Activity 2014-260 *Partner*. Contribute to development; facilitate validation and scaling-up of incentive based policy instruments that influence the trajectories of farmer?s households towards better adaptation to climate change. Contribute to cross cutting activities on database management, gender, monitoring and evaluations, capacity development related to policies and institutional arrangements.	New Delhi, India
Partner	Aryal, Jeetendra <j.aryal@cgiar.org>	Activity 2014-257 *Leader*.	New Delhi, India

Partner #2

Institution: IFPRI - International Food Policy Research Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Joshi, PK <p.joshi@cgiar.org>	Contribute to development; facilitate validation and scaling-up of incentive based policy instruments that influence the trajectories of farmer?s households towards better adaptation to climate change. Contribute to cross cutting activities on database management, gender, monitoring and evaluations, capacity development related to policies and institutional arrangements. Activity 2014-260 *Leader*.	New Delhi, India

Partner #3

Institution: ICRISAT - International Crops Research Institute for the Semi-Arid Tropics

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Whitbread, Anthony <a.whitbread@cgiar.org>	Activity 2014-257 *Partner*. Activity 2014-258 *Partner*. Contributing to the development and validation of LAPA, CSA business models and modelling CSAPs related to rainfed systems across the sites. Major responsibility to implementing the project activities in within CSVs in Karnataka, Andhra Pradesh and contribute to the other locations. Contribute to cross cutting activities on database management, gender, monitoring and evaluations, capacity development.	Patancheru, India

Partner #4

Institution: ICAR - Indian Council of Agricultural Research

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Sikka, A.K <aksikka@icar.org.in>	Activity 2014-257 *Partner*. Activity 2014-258 *Partner*. Activity 2014-260 *Partner*. Contribute to the validation and scaling-up of LAPA guidelines and leveraging resources through linking related projects for scaling out climate smart agriculture in India. Contribute to validation of CSAP business models in India. Contribute to the development of incentive based policy instruments for CSAPs portfolios for diverse ecologies and within CSV sites (CCAFS and NICRA) across India. Facilitate stakeholder consultation and partnerships with NARES (ICAR Institutes, State Agriculture Universities, State Department of Agriculture) and leveraging resources through linking related projects for scaling out climate smart agriculture.	HQ

Partner #5

Institution: BARC - Bangladesh Agricultural Research Council

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Director, Executive <dir-aic@barc.gov.bd>	Activity 2014-257 *Partner*. Activity 2014-258 *Partner*. Activity 2014-260 *Partner*. Contribute to the validation and scaling-up of LAPA guidelines and leveraging resources through linking related projects for scaling out climate smart agriculture in Bangladesh. Contribute to validation of CSAP business models in Bangladesh. Contribute to the development of incentive based policy instruments for CSAPs portfolios for diverse ecologies and within CSV sites in Bangladesh. Facilitate stakeholder consultation and partnerships with BARC, BARI, BRRI, Department of Agriculture etc) and leveraging resources through linking related projects for scaling out climate smart agriculture in Bangladesh.	HQ

Partner #6

Institution: IWMI - International Water Management Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>	Activity 2014-258 *Partner*. For sensitization and orientation of stakeholders about local level mainstreaming of CSAPs and CSVs, CIMMYT together with other partners and CCAFS-South Asia program will jointly organize stakeholder consultations, guidelines and training material related to LAPA and CS business models. As the South Asia Regional Program was hosted by IWMI and hence the activities mentioned to IWMI but its basically CCAFS-South Asia.	HQ

Partner #7

Institution: WUR - Wageningen University and Research Centre

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Groot, Annemarie <annemarie.groot@wur.nl>	Activity 2014-258 *Leader*.	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	Fund cuts resulted in IFPRI moving out of the project, and we could not achieve the deliverable assigned to them. For the coming planning 2017, the link of the deliverable remains missing which is required to be filled through other partners meeting the project outcome. This project has been merged to P
2016	Fund cuts resulted in IFPRI moving out of the project, and we could not achieve the deliverable assigned to them. For the coming planning 2017, the link of the deliverable remains missing which is required to be filled through other partners meeting the project outcome.

Partnerships overall over the last reporting period:

Integrated approach towards outcome was targeted by all the partners in the Collaborating the expertise and skill with the vested mutual interest have played significant role in accomplishing the deliverables on time meeting the standard criterias. With domain strength, IRRI provided its support in intervention activities in Bangladesh, with support from BARC. WUR have provided business aspect to the existing platform with establishing links among different sectors. ICAR has been the nodal institute providing support at project sites extending scientific and administrative support. Field operations and research is done in very close collaboration with BISA

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
Country			Bangladesh
Country			India

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
Guidelines and governance for LAPA emerging from the case studies in CSVs will help identifying CSAPs, business cases, incentives and institutional arrangements that encourage actors at all levels to invest more in CSA interventions. This will lead to enabling mechanism and environments for scaling-up CSA that will lead to [i] a 15% annual increase in investments on CSA by local and sub-national Governments, [ii] enhanced participation of the private sector in the scaling out of CSA with benefits for 1.0 million rural and urban men- and women-headed households in the 3 countries, and [iii at least 10 International, regional and national developmental organizations using the CCAFS-informed tools, practices and policies for the prioritization of climate smart agriculture. Based on CCAFS informed outputs, the boundary partners and local bodies actively using evidence-based guidelines and strategies for LAPA and CSVs in policies and investment priorities for food security in all 2 countries.

Annual progress towards outcome (end of 2016*): Framework of CSA led business cases and at least one case study on LAPA/business case has been documented and shared with boundary partners and local governments/bodies

Annual progress towards project outcome in the current reporting cycle (2016*): Since this project has been merged to P 25, the annual progress towards project outcome during 2016 is reported to P 25
How communication and engagement activities have contributed to achieving your Project outcomes:* Since this project has been merged to P 25, the annual progress towards project outcome during 2016 is reported to P 25
Evidence documents of progress towards outcomes:* <Not Defined>

Annual progress towards outcome (end of 2015): During 2015, the project will focus on documenting institutions, actors and policies supporting mainstreaming CSA at community level, potential CSA led business cases and LAPA guidelines and atleast 1local/sub-national bodies have adopted these

Annual progress towards outcome (end of 2017): Business plans for the short listed 'Potential business cases developed at Haryana, Bihar, Punjab and 1 site in Bangladesh and validated resulting inti strenthening innovation platforms. Publications on business cases and policies supporting CSAPs. Strategic entry points identified for co-investments in CSA interventions

Annual progress towards outcome (end of 2018):

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* Please see in P 25

4.2 CCAFS Outcomes

RP SAs Outcome 2019: Governments, private sector and farmer organizations increase their investments and develop incentive mechanisms to promote wide scale adoption of improved climate-smart practices and technologies

Indicator #1: # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

2019
Target value: 1
Cumulative target to date: 3
Target narrative: 1 million farmers implement portfolio of CSA practices and technologies for climate change adaptation in wheat and maize systems in Bangladesh, India and Nepal
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 1
Cumulative target to date: 1
Target narrative: <Not Defined>
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 1
Cumulative target to date: 2
Target achieved: 1.0
Target narrative: 200000 farmers implement portfolio of CSA practices and technologies for climate change adaptation in wheat and maize systems in Bangladesh, India
Narrative for your achieved targets, including evidence: Mainstreaming of Climate smart agriculture and Climate smart villages by govt. of Bihar will help to adopt and implement the technology by large number of smallholder farmers by 2019.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: There have gender specific interventions made for the adoption of climate smart agriculture technologies by the women. This mainly focused on their decision making and access& control over resources for better household livelihood. Socio-economic parameters were analysed for a well structured capacity building of the women and marginalised groups for their inclusion in climate smart villages scaling project.
The expected annual gender and social inclusion contribution to this CCAFS outcome: it will also promote a policy implementation environment that always involves women in male-headed households in case study planning and decision- making.

Major Output groups:

● F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

● F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

● F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
The evidence for CSAPs generated under FP 1 are being shared with FP 4.1 to catalyse the policy planners for prioritization investments on scaling CSAPs as a risk management strategies in view of the recent climate related risks.

Collaborating with other CRPs

Maize
Description of collaboration: The Sustainable Intensification Flagship of MAIZE CRP and CCAFS FP 1 activities are complementing each other and are co-developed in a participatory mode at some of the locations. The SI interventions developed are further validated from the lenses of CSA through documenting mitigation co-benefits of these SI interventions across ecologies.

4.4 Case Studies

Case Study #76

Title: Scaling of Climate Smart Villages across 38 districts of Bihar

Year: 2016

Project(s): P53

Outcome Statement: With CCAFS informed science backed evidence, knowledge, enhanced capacity and improved climate literacy of key decision makers, the climate smart agriculture practices have been mainstreamed in the Government of Bihar's investment and agricultural development plan targeting climate smart villages (CSVs) to be implemented across all 38 districts helping several hundreds of thousands small holder men and women farmers to improve their food, nutrition and livelihoods while coping with climate risks.

Research Outputs: Evidence on climate smart agriculture practices and Climate-Smart Villages in CCAFS's pilot sites implemented by CIMMYT-BISA and partners. (Report uploaded) https://www.dropbox.com/s/3slu4ngpnvy86zx/CSVs%20in%20Bihar_ML.pdf?dl=0 https://ccafs.cgiar.org/publications/climate-change-adaptation-greenhouse-gas-mitigation-and-economic-profitability#.WKaIJOSB-Uk http://dx.doi.org/10.1016/j.fcr.2014.04.015 http://onlinelibrary.wiley.com/doi/10.1111/sum.12331/pdf http://www.sciencedirect.com/science/article/pii/S0065211315300055 https://ccafs.cgiar.org/publications/economic-benefits-climate-smart-agricultural-practices-smallholder-farmers-indo#.WKaY8uSB-Uk Governance, guidance, LAPA : https://www.dropbox.com/s/x0rufzjc4afd9k6/LAPA-Climate%20Smart%20Villages_28-08-2015.pdf?dl=0 (File Uploaded) Development and assessment of portfolio of CSA interventions in Climate-Smart Villages : http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=26-27 http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=35-36 Increased awareness and capacity of local govt officers and other stakeholders to design and implement Climate-Smart Villages in Bihar. https://www.dropbox.com/s/4wu9rghjxzsx722/CCAFS%20trainings%20database.xlsx?dl=0 Policy decision for scaling climate smart agriculture in Bihar: Based on series of consultations, capacity development and sharing evidence, the Bihar Agricultural Management & Training Institute (BAMETI), Government of Bihar have taken decision to implement climate smart agriculture and CSVs in all 38 districts of Bihar. http://www.cimmyt.org/wp-content/uploads/2017/01/letter-1_bihar-story.pdf. Farmers testimonials and CSAPS videos

Research Partners: Key research partners includes national agricultural research system [Indian Council of Agricultural Research (ICAR), State Agriculture Universities], Borlaug Institute for South Asia (BISA), Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Bayer Crop Science, and CGIAR centers.

Activities: Participatory research to generate science backed evidence on Climate Smart Agricultural Practices (CSAPs) from Climate Smart Village Pilots in Samastipur and Vaishali districts of Bihar Sharing the evidence on CSAPs through presentations in high level meetings and workshops. A stakeholder consultation led by Agriculture Production Commissioner of Bihar was organized for mainstreaming of CSAPs in the "Innovative Agricultural Road-Map" of Bihar. Capacity development of stakeholders through travelling seminars, training workshops and field days for knowledge dissemination about CSAPs involving participation from the government. High level policy leaders (Chief Minister, Agriculture Minister and senior officials of Government of Bihar) visits the CCAFS pilot sites at Samastipur and Vaishali Districts and had insights of CSAPs and CSVs from the farmers and other stakeholders. http://www.cimmyt.org/participatory-scaling-of-climate-smart-agriculture/ Strategic blending of people, policy and productivity for a sustainable future has been embedded in the work-plan of Govt of Bihar, addressing and scaling climate smart agriculture.

Non-Research Partneres: Department of Agriculture, Bihar Agriculture Management and Training Institute (BAMETI), Government of Bihar, Farmer cooperatives, service providers and private sector (machine manufacturers, seed companies). CIMMYT-BISA linkages with the leading NGOs in the region are planned for targeting the women engaged in agriculture. Capitalizing on their women groups and disseminating CSA knowledge is intended to achieve gender equity in agriculture.

Output Users: Department of Agriculture, Ministry of Agriculture and Ministry of Environment, Government of Bihar for implementation of their policies. Research organizations like ICAR, State Agriculture Universities, Wheat and Rice Agri-food system CRPs, to expand their scope. KVKs, NGOs, CSOs, farmer cooperatives, service providers, women groups for improved knowledge and capacity.

Evidence Outcome: Chief minister of Bihar presented letter to DG CIMMYT on CIMMYT 50 event emphasizing work to address climate change challenges http://www.cimmyt.org/wp-content/uploads/2017/01/Letter-2_Bihar-story.pdf. BAMETI, Govt of Bihar issued letter to CIMMYT-CCAFS, stating plan to implement CSAPs. http://www.cimmyt.org/wp-content/uploads/2017/01/letter-1_bihar-story.pdf. Bihar Krishi Road map and Chief ministers visit to Pilot research sites http://www.cimmyt.org/participatory-scaling-of-climate-smart-agriculture/

Output Used: The Department of Agriculture, Government of Bihar have initiated new schemes and planned investments for scaling CSA and CSVs across the Bihar state. Two project proposals on CSA built on CCFAS informed evidence got funded and are being implemented by Govt of Bihar

References Case:

https://ccafs.cgiar.org/publications/climate-change-adaptation-greenhouse-gas-mitigation-and-economic-profitability#.WKaIJOSB-Uk http://dx.doi.org/10.1016/j.fcr.2014.04.015
http://onlinelibrary.wiley.com/doi/10.1111/sum.12331/pdf
http://www.sciencedirect.com/science/article/pii/S0065211315300055
https://ccafs.cgiar.org/publications/economic-benefits-climate-smart-agricultural-practices-smallholder-farmers-indo#.WKaY8uSB-Uk
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=26-27
http://www.isa-india.in/wp-content/uploads/2016/12/Extended-summaries-book-Vol.-1.pdf#page=35-36

Primary 2019 outcome indicator(s):

● # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

Link between outcome story and and the FP Outcome(s): <Not Defined>

Annex uploaded:
https://marlo.cgiar.org/data/ccafs/projects//25/caseStudy/LAPA-Climate%20Smart%20Villages_28-08-2015.pdf

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>

Major Output groups - 2016
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** List of CSAPs/services with good potentials for business case development (Potential business cases) developed and thus. Business plans developed in Haryana, Bihar,Punjab& 1 site in Bangladesh. **Brief summary of your actual 2016 contribution towards the selected MOG:** the list of potential business cases identified will be targeted to be integrated in the Govt of Bihar investment plan for scaling CSVs. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** In developing business models gender and social inclusion are considered vital. **Summary of the gender and social inclusion dimension of the 2016 outputs:** gender and socially disadvantaged groups will be given due recognition in the plans developed
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** Local innovation platforms developed thereby empowering local government bodies,rural women&youths as climate smart farmers to implement LAPA&scaling-out climate adaptation strategies. **Brief summary of your actual 2016 contribution towards the selected MOG:** Various strategic stakeholder consultations were organized with decision making partners in play and thus local innovation platform for scaling has been developed. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** It will promote a policy implementation environment that always involves women in male-headed households in decision- making. **Summary of the gender and social inclusion dimension of the 2016 outputs:** ender and socially disadvantaged groups will be given due recognition in the plans developed

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Business plans for the short listed 'Potential business cases developed at Haryana, Bihar, Punjab and 1 site in Bangladesh and validated resulting in strenthening innovation platforms. Publications on business cases and policies supporting CSAPs. Strategic entry points identified for co-investments in CSA interventions

Brief summary of your actual 2016 contribution towards the selected MOG: Scaling the technology for adoption was targeted withe establishment of well-informed and validated case of the climate smart technology. Other business opportunities are also identified for further scaling of CSAPs.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: It will promote a policy implementation environment that always involves women in male-headed households in case study planning and decision- making.

Summary of the gender and social inclusion dimension of the 2016 outputs: Business plan developed inclusion of gender role with women empowerment focus while promoting CSAPs technologies.

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Strengthened innovation platforms at the local level at Haryana, Bihar,Punjab and 1 site in Bangladesh

Brief summary of your actual 2016 contribution towards the selected MOG: There is need of business plan intervention made for scaling of CSAPs across typologies to suit the local adaptation requirements.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: It will promote a policy implementation environment that always involves women in male-headed households in decision- making.

Summary of the gender and social inclusion dimension of the 2016 outputs: The innovation platform developed involves gender exclusive particpation towards contributing in the overall improved livelihood structure

Major Output groups - 2015
F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA) **Brief bullet points of your expected annual 2015 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2015 contribution towards the selected MOG:** Developed incentive framework for multi-actor institutional mechanism for mainstreaming CSA interventions Empowered local government bodies,rural women&youths as climate smart farmers to implement LAPA& scaling-out climate adaptation strategies **Brief`2015 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2015 outputs:** Gender and social equity are taken into account as an approach towars scaling CSVs
F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2015 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2015 contribution towards the selected MOG:** Synthesis report of local level incentives& policies supporting CSA for all CSV sites in India Established innovation platform for LAPA in Haryana and Bihar Establish local innovation platforms at Haryana, India **Brief`2015 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2015 outputs:** Gender and social equity are taken into account as an approach towars scaling CSVs

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Develop criteria and business assessment tool to identify and evaluate business opportunities/ barriers from CSA perspective Identify lengthy list of CSAPs with potential business cases development in Haryana and Bihar, India Action plans for developing business cases for promising CSAPs at Haryana, Bihar and Punjab, India

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towars scaling CSVs

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Framework, guidelines& governance structure for LAPA from case studies in established CSVs (Haryana, Bihar, Punjab) Publications on evidence for synergies between LAPA&CSVs as strategy for climatechange adaptation and food security

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender and social equity are taken into account as an approach towars scaling CSVs

Major Output groups - 2014

F2 (before F1 - Andy): Approaches, strategies and scaling up/out mechanisms (e.g CSV), for enhanced adaptive capacity and resilience from the field to the sub-national level (LAM, WA, SA, EA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Innovative knowledge management systems (ICT, information network, multi-stakeholder platforms, learning alliances, fora etc) and strategic engagements approaches and partnerships that promote access, co-creation, capacity building, learning, 2 ways sharing and dissemination of CSA information and tools to farmers, extension services, agro-dealer networks, local governments, private sector, academia etc. (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Context specific (targeted) suitable CSA options and portfolios that build on traditional knowledge, meet the needs of farmers and enhance productivity, adaptive capacity, food security and social equity (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D594 - Validation of selected CSAPs led business cases at Haryana, Bihar, Punjab& 1 site in Bangladesh

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.dropbox.com/s/djvnrboxcu8lcrj/D%201401-%20Business%20Case.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance:

- File: https://marlo.cgiar.org/data/ccafs/projects//594/deliverable/Assurance/Baseline%20Prateek%20v2.xlsx

Data dictionary:

- File: https://marlo.cgiar.org/data/ccafs/projects//594/deliverable/Dictionary/metadata%20SP-v6.xlsx

Are the tools used for data collection available:

- File: https://marlo.cgiar.org/data/ccafs/projects//594/deliverable/Tools/BM%20qustionnaire.doc

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML <m.jat@cgiar.org>	Responsible

D629 - Synthesis report of local level incentives and policies supporting CSA for CSV sites in Bangladesh

Main Information

Type: Reports and other publications

Subtype: Research workshop report

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.dropbox.com/s/s06r9kaztxb2khw/D%20629.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Mittal, Surabhi <s.mittal@cgiar.org>	Responsible

D630 - Strategic entry points identified for prioritization&synergies for co-investments in CSA interventions under CSVs in Bangladesh.

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//53/deliverableDataSharing/Strategic%20entry%20points.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Mittal, Surabhi <s.mittal@cgiar.org>	Responsible

D2951 - Knowledge sharing and dissemination of CSAPs

Main Information

Type: Outreach products

Subtype: Social Media Output

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.voanews.com/a/indian-farmers-battle-with-climate-smart-agriculture/3460162.html; %20https://www.dropbox.com/sh/awkae9f3u34unj0/AADQd6l2naJtHdZBJUcH1a3Ha?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
ICAR - Indian Council of Agricultural Research	Sikka, A.K <aksikka@icar.org.in>	Responsible

D1401 - A publication (report, research paper, policy brief) on business cases

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.isa-india.in/wp-content/uploads/2016/12/Lead-paper-Vol.-4.pdf#page=44

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and Research Centre	Groot, Annemarie <annemarie.groot@wur.nl>	Responsible

D602 - Developed incentive framework for multi-actor institutional mechanism for mainstreaming CSA interventions

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Cancelled

Year of expected completion: 2015

Justification of new expected date of completion: Due to fund cut IFPRI, had to move out of the project and thus the deliverable remains incomplete

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: <Not Defined>
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: <Not Defined>
Data dictionary: <Not Defined>
Are the tools used for data collection available: <Not Defined>

Deliverable Data sharing

Deliverable files:
<Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
IFPRI - International Food Policy Research Institute	Joshi, PK <p.joshi@cgiar.org>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML<m.jat@cgiar.org>	Other

D2971 - International training workshop on CSA Business Models

Main Information

Type: Training materials

Subtype: Lecture/Training Course Material

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Youth
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.cimmyt.org/making-farming-profitable-scaling-climate-smart-agriculture-through-business-model-innovations/

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Making Farming Profitable: Scaling Climate-Smart Agriculture through Business Model Innovations

Description / Abstract: Under the aegis of the CGIAR research program on Climate Change, Agriculture and Food Security (CCAFS), CIMMYT and Wageningen University (WUR), The Netherlands, undertook activities to develop and scale innovative CSA business models at climate-smart village (CSV) sites in South Asia. To consolidate the work done and plan future activities, a workshop titled "Climate Smart Agriculture: Business modeling and innovation platforms for scaling" was held at WUR on 4 July 2016. Twenty-five participants from CIMMYT, India's NARS (ICAR, SAU), WUR, KIT and private organizations attended the session.

Publication / Creation date: <Not Defined>

Language: English

Country: Netherlands

Keywords: <Not Defined>

Citation: <Not Defined>

Handle: <Not Defined>

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and Research Centre	Groot, Annemarie <annemarie.groot@wur.nl>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML<m.jat@cgiar.org>	Other

D574 - Established innovation platform for LAPA in Haryana and Bihar

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2015

New expected year: 2016

Cross-cutting dimension:

- Gender
- Youth
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.dropbox.com/s/3ygsnlll05i8pue/Report%20on%20Innovation%20Platform%20for%20LAPA.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Local Adaption Plan for Action (LAPA) Innovation Platforms in Haryana and Bihar

Description / Abstract: The major challenges being faced by agriculture globally are degradation of natural resources and increasing frequency of climate change induced risks. There are initiatives taken at different levels and scales to address these issues. For example, at national level, the National Action Plan on Climate Change (NAPCC) and at State level, State Action Plans on Climate Change (SAPCC) have been prepared to combat the growing vulnerabilities due to climate change. However, various states in their State plan have highlighted increasing realization of need for local adaptation of plan of action (LAPA) in order to effectively implement the national and state level plans at local level. Under CCAFS Flagship project on Climate Smart Agriculture, we developed a road map for designing a local adaptation plan of action (LAPA) and mainstreaming climate-smart villages into it for scaling-up climate smart agricultural practices relevant to diverse farm household typologies. Building on the LAPA framework and guidelines, we have also established the innovation platforms (IPs) for LALA for mainstreaming the CSAPs and their scaling for impact on large number of women and men smallholder farmers.

Publication / Creation date: <Not Defined>

Language: English

Country: India
Keywords: Innovation platform, youth, climate smart agriculture
Citation: Jat, ML and Agarwal, T. 2016. Local Adaption Plan for Action (LAPA) Innovation Platforms in Haryana and Bihar. Research Report. CGIAR Research Program on Climate Change, Agriculture and Food Security, CIMMYT.
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and Research Centre	Groot, Annemarie <annemarie.groot@wur.nl>	Responsible
ICAR - Indian Council of Agricultural Research	Sikka, A.K<aksikka@icar.org.in>	Other
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Aryal, Jeetendra<j.aryal@cgiar.org>	Other
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML<m.jat@cgiar.org>	Other

D590 - A short list of CSAPs/services with good potentials for business case development (Potential business cases)

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:

- Gender
- Capacity Development

Gender level(s):

- Collection of sex-disaggregated data

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance:

- File: https://marlo.cgiar.org/data/ccafs/projects//590/deliverable/Assurance/Baseline%20information.AG.2.docx

Data dictionary: ● Yes, but not documented
Are the tools used for data collection available:

- File: https://marlo.cgiar.org/data/ccafs/projects//590/deliverable/Tools/Mission%20report%20May%202016%20-%20Jaclyn%20WUR.pdf

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//53/deliverableDataSharing/D590.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and Research Centre	Groot, Annemarie <annemarie.groot@wur.nl>	Responsible
CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo	Jat, ML<m.jat@cgiar.org>	Other

D591 - Business plans for short listed 'Potential business cases in Haryana, Bihar,Punjab& 1 site in Bangladesh

Main Information

Type: Data, models and tools

Subtype: Data portal/Tool/Model code/Computer software

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: Yes
License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//53/deliverableDataSharing/D591.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and Research Centre	Groot, Annemarie <annemarie.groot@wur.nl>	Responsible

D592 - Strengthened innovation platforms at the local level at Haryana, Bihar,Punjab and 1 site in Bangladesh

Main Information

Type: Data, models and tools

Subtype: Database/Dataset/Data documentation

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
<Not Defined>

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: https://www.dropbox.com/s/twz2wybonin2hvk/D592.pdf?dl=0

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: <Not Defined>
Description / Abstract: <Not Defined>
Publication / Creation date: <Not Defined>
Language: <Not Defined>
Country: <Not Defined>
Keywords: <Not Defined>
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Process of data quality assurance: ● Yes, but not documented
Data dictionary: ● Yes, but not documented
Are the tools used for data collection available: ● Yes, but not documented

Partners contributing to this deliverable:

Institution	Partner	Type
WUR - Wageningen University and	Groot, Annemarie	Responsible

	Research Centre	<annemarie.groot@wur.nl>

5.3 Project Highlights

No project highlights added

6. Activities

A258 - Developing and defining innovative business models and open innovation platforms for scaling CSAPs

Description: This activity involves an iterative process to scan, define and address opportunities and barriers for developing, piloting and scaling business cases for CSAPs. Innovation platforms will be established around CSAPs. At the local level, these innovation platforms consist of developers of CSAPs, customers of the CSAPs (in CSVs) and, stakeholders from marketing, retail, investment and policy domains. Second, meta-innovation platform, involve members operating at higher governance levels e.g. investors, policy makers, national research/extension institutes, NGOs and local innovation platforms. Innovation platforms will lead in the development, piloting and scaling-up of climate smart agri-business models. Principle approach is to capture and further develop agri-business opportunities at local level and scaling-up these business opportunities to a higher spatial level. A geographically differentiated approach of CSA measures and strategies will be adopted for identification of Business Opportunities', 'defining Potential Business Cases', 'transforming them into actual Business Cases' and piloting and scaling these businesses'.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Jat, ML <m.jat@cgiar.org>
Status: On-going

Overall activity or progress made during this cycle: This activity involves an iterative process to scan, define and address opportunities and barriers for developing, piloting and scaling business cases for CSAPs. Innovation platforms will be established around CSAPs. At the local level, these innovation platforms consist of developers of CSAPs, customers of the CSAPs (in CSVs) and, stakeholders from marketing, retail, investment and policy domains. Second, meta-innovation platform, involve members operating at higher governance levels e.g. investors, policy makers, national research/extension institutes, NGOs and local innovation platforms. Innovation platforms will lead in the development, piloting and scaling-up of climate smart agri-business models. Principle approach is to capture and further develop agri-business opportunities at local level and scaling-up these business opportunities to a higher spatial level. A geographically differentiated approach of CSA measures and strategies will be adopted for identification of Business Opportunities?, ?defining Potential Business Cases?, ?transforming them into actual Business Cases? and piloting and scaling these businesses.

Deliverables in this activity:

- D590: A short list of CSAPs/services with good potentials for business case development (Potential business cases)
- D591: Business plans for short listed 'Potential business cases in Haryana, Bihar,Punjab& 1 site in Bangladesh
- D592: Strengthened innovation platforms at the local level at Haryana, Bihar,Punjab and 1 site in Bangladesh
- D593: Meta innovation platform established at the higher level in India and Bangladesh
- D594: Validation of selected CSAPs led business cases at Haryana, Bihar, Punjab& 1 site in Bangladesh

A260 - Develop incentive based policy instruments that influence farmer's households trajectoriestowards better adaptation to climate change

Description: This activity aims at mainstreaming incentives through evolving enabling policies and innovative institutions for promoting CSA interventions&services within the framework of CSVs. Incentive based policy instruments will be recommended based on robust science-based evidence that influences the trajectory of farmers for better adaptation to climate change. The activity will also focus on understanding incentives and institutional arrangements for CSV governance for empowering local communities to adopt and scale-out CSAPs. The recommendations will feed into local and sub-national policy that will be instrumental in influencing farm households to increase adoption of CSAPs and improve ability to adapt to production and marketing risks of climate change. The output will develop policy instruments and mechanism that ensure equal participation of 25-50% marginalized groups and 30-50% female-headed households in CSA development activities. It will also promote a policy implementation environment that always involves women in male-headed households in case study planning and decision-making.

Start date: Jan 2015 **End date:** Dec 2018

Activity leader: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo Mittal, Surabhi <s.mittal@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: <Not Defined>

Deliverables in this activity:

<Not defined>

7. Leverages

No leverages added