RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security

IFPRI

2013 technical report

1. Activity Reporting

Activity 577-2013 (Milestone 1.3.2 2014.) Commissioned

Title: Community-based Insurance in Agriculture: Conceptualization and Institutionalization of the Processes.

Status: **Partially complete.** Draft report is under preparation on Meta analysis of agriculture insurance at global level. In addition to this two pilots with CCAFS were initiated on community based insurance.

Gender component:

Female farmers headed household will be involved in community based insurance.

Deliverables:

- Community-based insurance products and their processes developed.
the piloting results on community based insurance are awaited.
- Develop road map for piloting the community-based insurance products.
After getting the date from pilot studies, the road map will be prepared.
- Assessment of farmers' preferences and willingness to pay for community-based agricultural insurance.
Data has been collected, the analysis is in progress.

Partners:

IWMI; AIC

Locations:

South Asia (SAs)

Activity 578-2013 (Milestone 2.3.1 2013.)

Title: Investigating the Impact of Climate Extremes on Future Water and Food Security.

Status: **Partially complete.** Significant progress was made in 2013 towards achieving the project's objectives. The household survey in Ethiopia was completed and initial analysis of the data was conducted. The results were written up in a descriptive report and presented at the midterm workshop for this "Climate Extremes" project. The papers on drought in India are close to being finalized and will be submitted to a journal in 2014. Similar analyses for Pakistan were completed and the results were published in a special edition of Water International. Drafts of the review paper on droughts in India and East Africa and the paper on climate and crop yields in India have been completed and will be submitted in early 2014. Finally, a midterm workshop was held with stakeholders from India, Kenya and Ethiopia in Washington, DC in December where project results were shared and the stakeholders provided feedbacks on the results and future research plans for the project.

Gender component:

The household survey in Ethiopia will enable us to assess the impacts of climate shocks, including drought, on men and women and the roles played by men and women in coping with and in mitigating the risks of future extreme events.

Deliverables:

- A descriptive report on climate shocks, coping and adaptation strategies based on rural household survey in Ethiopia.

A descriptive report on the modules related to climate shocks, climate change perceptions, and coping and adaptation strategies was prepared using the Ethiopia dataset. The report will be used for internal purposes as background for papers that will be prepared in 2014 and has not been published in any form. The results from this report were also presented at the midterm workshop of this project in December 2013 in Washington DC.

- A paper on drought analysis for the Indo-Gangetic Plains of India submitted to a journal.

A drought analysis paper focusing on Pakistan, which covers much of the west section of Indo-Gangetic Plains was completed under this CCAFS-funded project and published in Water International:Xie, H., C. Ringler, T. Zhu, A. Waqas. 2013. Droughts in Pakistan: A Spatiotemporal Variability Analysis using the Standardized Precipitation Index. Water International, 38(5): 620-631. http://dx.doi.org/10.1080/02508060.2013.827889In 2013, we successfully deployed and validated a process-based model to investigate the impacts of climate change (which could be characterized by more frequent occurrence of drought) on groundwater resources in northwest India under presence of intensive irrigation agriculture. The preliminary results from this study were presented at the Annual IWMI "TECHIES' workshop in Nairobi during 11-14 June 2013, and refined results were presented at the Climate Extremes Project workshop held on December 6, in Washington D.C. A journal manuscript for this study is in preparation and will be submitted in 2014.

- A paper on risk-based drought management for CCAFS site in India submitted to a journal.

A similar analysis was completed for Pakistan under CCAFS and an article on this research was published in Water International:Zhu, T., C. Ringler, M. Mohsin Iqbal, T.B. Sulser, and M. Arif Goheer. 2013. Climate Change Impacts and Adaptation Options for Water and Food in Pakistan: Scenario Analysis using an Integrated Global Water and Food Projections Model. Water International, 38(5):651-669. http://dx.doi.org/10.1080/02508060.2013.830682The decision analysis paper was delayed due to difficulties in obtaining rainfall and farm data for the study area from the Indian government. However, as of December 2013, the rainfall data have now been received and the paper will be completed in 2014.

- A review paper on adaptive strategies for drought risk reduction in agriculture submitted as IFPRI Discussion Paper.

A draft of the review paper on "Adaptive Strategies for Drought Risk Reduction in Agriculture" was prepared and the results were presented at the midterm project workshop in December 2013. The paper will be submitted to the IFPRI Discussion Paper series in early 2014.A second review paper was completed for GIZ:Tennigkeit, T., A. Wilkes, C. Ringler, K. Solymosi. 2013. Rural development and adaptation to climate change: What do we know? Study commissioned by the sector programs Sustainable Resource Use in Agriculture (PN 9.2280.7) and Development of Rural Areas (PN 11.2222.6)

- A working paper on "Changes in climate and associated crop yield impacts in the Indo-Gangetic Plains of India during the past 50 years" (planned to submit to a jounral in 2014).

A working paper on "Changes in climate and associated crop yield impacts in the Indo-Gangetic Plains of India during the past 50 years" has been completed. The paper will be improved and submitted to a journal in 2014.

- Midterm workshop in New Delhi that involves researchers and policy-makers in the country besides CGIAR researchers

The midterm workshop was held on December 6 in Washington DC with participants from India and East Africa,

in addition to IFPRI researchers and collaborators. Participants from India and East Africa included senior officials from Indian Council of Agricultural Research and national meteorological agencies. The location of the workshop changed because several IFPRI staff were unable to obtain a visa to travel to India.

Partners:

University of Illinois

Locations:

East Africa (EA),South Asia (SAs)

Activity 579-2013 (Milestone 2.1.2 2013.) Commissioned

Title: Assessing the impact of appropriate risk management financial packages on household's asset portfolios in Bangladesh.

Status: **Complete.** The following deliverable are finalized:1) Data: A randomized control trial designed in Bangladesh2) Model tools and software: Model refined in light of behavioral results in Bangladesh (Paper what do farmers want? The impact of area-yield index insurance, health cards and savings on consumption, investment and welfare for farmers in Bangladesh)

Gender component:

We will look at how the type of risk covered alters outcomes for men and women.

Deliverables:

- A treatment arm of a randomized control trial designed in Bangladesh to further refine the model hypotheses. RCT in Bangladesh, data and questionnaire
- Model refined in light of behavioural results in Bangladesh.

Paper "What do farmers want? The impact of area-yield index insurance, health cards and savings on consumption, investment and welfare for farmers in Bangladesh"

Partners:

PKSF; DATA

Locations:

South Asia (SAs)

Activity 580-2013 (Milestone 3.1.1 2013.)

Title: Climate change adaptation, mitigation and building economic resilience in West Africa and South Asia.

Status: **Complete.** During 2013 the essential local collaborations within the West African case study countries (Burkina Faso and Guinea) were solidified and operationalized, and contracts were executed with the key agencies that will coordinate the analytical work in those countries. In order to enhance the policy impact of the project, we chose to engage with the government agencies directly responsible for the implementation of

agricultural sectoral policy in Burkina Faso and Guinea, so that the findings from the research could be more easily absorbed within the national decision-making structure. In both countries, we undertook an initial consultation to discuss with a representative group of stakeholders (convened by our partners) the important issues surrounding climate change, and the challenges of adaptation. To better focus our analysis, we sought to identify the most important agricultural sectors to concentrate on in each country. As a result of these consultations, we decided that rice was a key sector for Guinea, and that cotton, maize and livestock were the key ones for Burkina Faso. Through our partners, we undertook an information-gathering activity to find out as much information about what's currently known about the climate vulnerability in these sectors, and to identify the key pieces of data and informatoin that we'd need in our analysis. A comprehensive set of informaiton on the rice sector in Guinea has been collected, and we have also obtained detailed reports for the cotton, maize and livestock sectors in Burkina Faso, so that we can have a good basis for undertaking further quantitative analysis in 2014. In order to better engage with the policy processes in these countries, we have also undertaken an effort to document and understand where each of these countries has reached in the formation of a national adaptation plan for climate change. Whereas an initial adaptation plan for agriculture (PANA) exists for these countries, they are currently engaged in the formation of a wider-reaching and more forward-looking national adaptation plan (PNA) whose design we seek to directly influence through our research activity. A detailed account of this process has been obtained for Burkina Faso, through the work of a local collaborator who's closely involved in it. Further work and follow-up will be done in 2014.

Gender component:

The demographic characteristics at the household level will be considered when evaluating how adaptive capacity can be enhanced for rural farmers. To the extent possible, the dimensions of vulnerability to climate change that are relevant to gender will also be considered.

Deliverables:

- Key consultations to identify the key concerns on climate vulnerability.

consultations with local collaborators and key stakeholders to discuss and identify the critical concerns surrounding vulnerability to climate change and possibilities for adaptation

- Reports on outcomes and insights from country workshops.

Reports from consultations convened by local collaborators in Burkina Faso and Guinea that document the key policy concerns about climate change and priorities for adapation. A focus on the critical sectors is given and critcal sources of information are described.

Partners:

SP/CPSA; ANDASA

Locations:

West Africa (WA),South Asia (SAs)

Activity 581-2013 (Milestone 3.1.1 2013.)

Title: Low Emission Development Strategies (LEDS) in agriculture.

Status: **Partially complete.** The countries targeted for this project are: Vietnam, Bangladesh, Colombia, and Zambia. The work (data collection, modeling, analysis, and report writing) is completed for Vietnam (we are in the process of editing a final report) and Bangladesh (in the process of writing the final report). Modeling work in currently undergoing in Colombia and Zambia.

Gender component:

Deliverables:

- 2-4 weeks training for modelers on LEDS. Models: IMPACT and Land Use modeling.

The training objective was to create the in-country capacity necessary to undertake a careful analysis of locally viable low emission development strategies. The output of this type of analysis is of strategic importance to inform policy makers on the available developmental pathways, mindful of the effects on the environment. The training focused on the main components of the modeling approach: the IMPACT model and a land use model of land use choices.The modeling begins using the IMPACT model, which generates projections for agricultural area (by relevant crops) and projections for commodity prices. These projections account for climatic changes. The model of land use change is then used to determine the evolution of the landscape through time and to allocate the crop areas determined by IMPACT. This information is used to determine the GHG emissions in the business-as-usual case, the baseline. The alternative scenarios, and their GHG emission profiles, are generated acquiring country-specific knowledge of policy and development objectives and likely or pending investments on infrastructure development (for example, road construction). This framework is used to identify the potential for developing and implementing low emissions agricultural policies while ensuring sustainable food security. Specifically, the model will be used to determine the GHG emissions for the period under consideration and under the assumed development scenarios (baseline), and the potential reduction of emissions deriving from reduced deforestation, and/or changes in agronomic practices or land allocation to crops.

- One-week workshop in each country. Workshop directed to policy-makers and extension service on climate change constranits and opportunities for development and interpretation and appropriate use of LEDS.

A series of dissemination workshops were held in Vietnam and Bangladesh. Workshops will be held in Colombia and Zambia in 2014.

Partners:

ICRAF; NIAPP; CIAT; BCAS

Locations:

South Asia (SAs),Latin America (LAM),South East Asia (SEA)

Activity 582-2013 (Milestone 3.2.1 2013 (2).)

Title: Study on the economic viability of climate change mitigation through the use biochar.

Status: **Partially complete.** All the data has been collected and analyzed. Due to delays in the collection of field data, we are behind schedule in the writing of the reports. We are now in the process of writing three papers on the topic.

Gender component:

Deliverables:

Partners:

CSIR; KNUST; UC Berkeley

Locations:

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

Activity 583-2013 (Milestone 3.3.1 2013.)

Title: Capturing the potential for greenhouse gas offsets in Indian agriculture.

Status: **Incomplete.** The project went through a reassessment and a joint steering committee was formed in order to provide better coordination between the project components. A meeting with presentation of preliminary results is scheduled for March 2014.

Gender component:

Deliverables:

Partners:

NSW Trade & Investment; Monash University; NCAER; IDFC

Locations:

South Asia (SAs)

Activity 584-2013 (Milestone 4.3.2 2013.)

Title: Global agricultural model intercomparisons with AR5 data (AgMIP project).

Status: **Complete.** A study published in a special feature of an issue of the Proceedings of the National Academy of Sciences, brought together nine of the world's most important economic modeling teams with a focus on agriculture to compare their results about the future of agriculture. The paper is the product of a multi-year collaboration between leading global research teams under the Agricultural Model Intercomparison and Improvement Project (AgMIP) and the Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP). Furthermore, seven studies were published in a special issue of Agricultural Economics. The latter were also introduced in a separate paper.

Gender component:

Deliverables:

- Special issue of the journal Agricultural Economics with papers based on the global economic model intercomparison based on the IPCC AR5 climate and socioeconomic data. Paper published in special issue of PNAS on global economic model intercomparison based on ISI-MIP exercise.

Correction: A study was published in a special feature of the December issue of the Proceedings of the National Academy of Sciences.

Partners:

Columbia University; OECD; FAO; WUR; USDA; UF

Locations:

Global

Activity 585-2013 (Milestone 4.1.3 2013.) Commissioned

Title: Increasing Women's Resilience to Confront Climate Change.

Status: **Complete.** 2013 deliverables have been met; however, the analysis is ongoing in 2014.

Gender component:

This project is focused on answering key gender-climate research questions:• How do men and women perceive climate change and, particularly, the livelihood risks associated with climate change? • What are the gender disparities in access to and control over assets and how and to what degree does the disparity in assets affect how men and women experience climate shocks and change? • How and to what degree does asset disparity determine how men and women respond to climate shocks and change? • Which coping strategies and adaptation options are favored by women and men, respectively, and why?

Deliverables:

- Train partners for implementation of the survey of IMPACT Lite sites in Bangladesh, Kenya, Senegal, and Uganda.

IFPRI staff trained survey teams in Bangladesh, Kenya, Senegal, and Uganda.

Partners:

ILRI; IITA; DATA; ISRA

Locations:

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

Activity 586-2013 (Milestone 4.2.1 2013 (1).) Commissioned

Title: Quantification of regional scenarios using global integrated models.

Status: **Partially complete.** In collaboration with the CCAFS scenarios team, and IIASA, IFPRI has helped complete the semi-quantification of scenarios for South Asia, Southeast Asia, Central America, and the Andes regions. This process has created the basis of the regional scenario narratives and the starting point for the scenario quantification for the models. Additionally, IFPRI has assisted in the full quantification and update of the East Africa region through 2050, and shared model results with the CCAFS scenario team and other partners.

Gender component:

Gender was considered in the semi-quantification process, and the development of the scenario narratives. However, gender itself is not included as a part of the final model inputs, as these models operate at a high levels of aggregation.

Deliverables:

- Participation in Latin America participatory scenario process. Workshop (tbd).

Helped lead two scenario development workshops for Central America and the Andes. Served as one of the primary facilitators in both regions.

Partners:

Locations:

South Asia (SAs),Latin America (LAM),South East Asia (SEA)

Activity 587-2013 (Milestone 4.3.1 2013) Commissioned

Title: Development of modeling tools to handle aggregation, landuse, non-traded goods, and trade policies.

Status: **Partially complete.** IMPACT version 3 has been implemented and tested, and now can replicate all of the functionality of the previous version of IMPACT. Full integration with the new and improved Water Model is complete, and has been tested and calibrated. New features that allow scenario analysis of commodity tradability and trade policy have been implemented, but still need to be fully tested and calibrated. Basic land-use has been implemented and calibrated and is now fully functional. This new version of IMPACT is currently being used in work for Global Futures, and CCAFS regional scenarios.

Gender component:

No gender integration. This web interface automatically selected yes, and won't let me change it to no.

Deliverables:

- Code implemented in the main IMPACT software branch that provides improved features for aggregation, landuse, non-traded goods, and trade policies.

The core model code has been completed. Tested and calibrated allowing for the recreation of all of the previous functionality of the previous version of IMPACT. We have begun to start testing new features of the model, and expect to be testing and calibrating these new features in the coming year

Partners:

Locations:

Global

2. Succinct summary of activities and deliverables by Output level

Output: 1.3.2

Summary:

Activity 580-2013 contributed to this output by initiating a systematic study of the policy process driving the formulation of the national climate adaptation plan of Burkina Faso, and how it will support the agricultural sector. The initial report of the consultant has been produced.

Activity 577-2013

Global review on Agriculture insurance was undertaken and draft report was prepared.

Prioritization of farmers choices and willingness to pay to different climate smart intervention, including agriculture insurance, where assessed and a report was prepared.

Lectures were delivered in India, Nepal and Sri Lanka on priority setting for climate smart agriculture. The training programs were attended by approx. 80 participants in different locations.

"Analyzing Countries' Human, Organizational and Systems Capacity and Policy Process to Proactively Respond to Impending Climate Change Challenges"; Additional activity, not reflected in the 2014 Activity Plan

Data sets were collected in 4 countries (Vietnam, Ghana, India, and Bangladesh) that will be used to understand at what stage each country is in developing climate-smart agricultural policies, the capacity of policy analysts to do so, and the perspectives different stakeholders have on CSA policies.

Output: 2.1.2

Summary:

No output identified.

Output: 2.3.1

Summary:

Activity 578-2013 contributed to this objective in 2013 by gathering a new dataset containing information on how households in the Nile Basin of Ethiopia experience and respond to climate shocks, and how they perceive and adapt to climate change. In the coming year, the dataset will be used to explore how different household livelihood and agricultural strategies contribute to resilience to climate shocks, with particular focus on gender differences.

Output: 3.1.1

Summary:

Activity 581-2013 contributed to this output by developing a modeling suite to analyze GHG reduction policies and their effects on agricultural revenues. The modelling includes the potential effects of agricultural expansion into forested areas.

Training of key researchers on utilization of the modeling tool.

Output: 3.2.1

Summary:

Activity 582-2013 developed a methodology to model adoption of Biochar in typical smallholder agriculture in Ghana based on field experiments. Economic analysis of the drivers of adoption of Biochar in Vietnam, Kenya, and Ghana.

Output: 3.3.1

Summary:

No output identified.

Output: 4.1.3

Summary:

The dataset for activity 585-2013 was collected in order to conduct analyses of gender-differentiated impacts of climate change; regional survey teams trained in intra-household and gender-aware survey methods.

Numbers trained:

Bangladesh: 22 men, 18 women

Senegal: 4 men, 5 women

Uganda: 5 men, 6 women

Kenya: 9 men, 8 women

Output: 4.2.1

Summary:

Activity 586-2013: Created a database of quantified regional socioeconomic scenarios through 2050 for East Africa. Updated IMPACT database to new base year, and generated a suite of tools for cleaning FAO data.

Output: 4.3.1

Summary:

Activity 587-2013: Developed a suite of climate change and socioeconomic scenarios. There are global scenarios to match with the IPCC's AR5 study, as well as region specific scenarios for East Africa, and West Africa. Published 5 country papers focusing on the effects of climate change on agriculture and food security on the US, Russia, India, China, and South Africa.

Output: 4.3.2

Summary:

Activity 584-2013 contributed to this output with the publication of 7 (and an introductory note) Agriculture Economics Papers and 1 PNAS paper reviewing the policy implications of the results of the second phase of AgMIP.

3. Publications

Publication #1

Type: Journal papers

CCAFS Themes: Theme 1, Theme 3, Theme 4.3

Citation: Bryan, E., C. Ringler, B. Okoba, J. Koo, M. Herrero, and S. Silvestri. 2013. Can agriculture support climate change adaptation, greenhouse gas mitigation and rural livelihoods? Insights from Kenya, Climatic Change, 118(2): 151-165.

Publication #2

Type: Journal papers

CCAFS Themes: Theme 1

Citation: Bryan, E., C. Ringler, B. Okoba, C. Roncoli, S. Silvestri, and M. Herrero. 2013. Adapting Agriculture to Climate Change in Kenya: Household Strategies and Determinants, Journal of Environmental Management, 114: 26-35.

Publication #3

Type: Journal papers

CCAFS Themes: Theme 2

Citation: Zhu, T., C. Ringler, M. Mohsin Iqbal, T.B. Sulser, and M. Arif Goheer. 2013. Climate Change Impacts and Adaptation Options for Water and Food in Pakistan: Scenario Analysis using an Integrated Global Water and Food Projections Model. Water International, 38(5):651-669.

Publication #4

Type: Journal papers

CCAFS Themes: Theme 2

Citation: Xie, H., C. Ringler, T. Zhu, A. Waqas. 2013. Droughts in Pakistan: A Spatiotemporal Variability Analysis using the Standardized Precipitation Index. Water International, 38(5): 620-631.

Publication #5

Type: Working papers

CCAFS Themes: Theme 2

Citation: Garima Taneja, Barun Deb Pal, P K Joshi, Pramod K Aggarwal and NK Tyagi 2013. Farmers' Preferences

for Climate Agriculture:An Assessment in the Indo-Gangetic Plain. Paper presented in "Institutions and Polices for Scaling-out Climate Smart Agriculture", Dec 2-3, 2013, Colombo, Sri Lanka

Publication #6

Type: Working papers

CCAFS Themes: Theme 4.3

Citation: Praduman Kumar, P K Joshi and Pramod Aggarwal 2013. Impact of Drought on Food Economy of India. Paper presented in "Institutions and Polices for Scaling-out Climate Smart Agriculture", Dec 2-3, 2013, Colombo, Sri Lanka

Publication #7

Type: Working papers

CCAFS Themes: Theme 4.3

Citation: N K Tyagi, Pramod K Aggarwal, P K Joshi and Divya Pandey 2013. Implications of Government Policies and Programs on Climate Change Adaption, Mitigation, and Resilience in Agriculture in South Asia. Paper presented in "Institutions and Polices for Scaling-out Climate Smart Agriculture", Dec 2-3, 2013, Colombo, Sri Lanka

Publication #8

Type: Working papers

CCAFS Themes: Theme 4.3

Citation: Deepak Shah, PK Joshi, Gerald C.Nelson, Daniel Mason-D'Croz and Amanda Palazzo 2013. Indian Food Security and Climate Change: Agriculture Future. Paper presented in "Institutions and Polices for Scaling-out Climate Smart Agriculture on Dec 2-3, 2013, Colombo, Sri Lanka

Publication #9

Type: Journal papers

CCAFS Themes: Theme 3

Citation: De Pinto, A., Robertson, R.: “Adoption of Climate Change Mitigation Practices by Risk-averse Farmers in the Ashanti Region, Ghana.” Ecological Economics, Vol 86, 47-54.

Publication #10

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Li, M., De Pinto, A., Ulimwengo, J., You, L., Robertson, R.,: "Modeling Land-use Allocation with Mixed-level Data: An Econometric Analysis for the Democratic Republic of the Congo." Environment and Resource Economics. (Forthcoming)

Publication #11

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Sikhalazo Dube, Robert J. Scholes, Gerald C. Nelson, Daniel Mason-D'Croz, and Amanda Palazzo (2013). South African Food Security and Climate Change: Agriculture Futures. Economics: The Open-Access, Open-Assessment E-Journal, Vol. 7, 2013-35.

Publication #12

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Sergey Kiselev, Roman Romashkin, Gerald C. Nelson, Daniel Mason-D'Croz, and Amanda Palazzo (2013). Russia's Food Security and Climate Change: Looking into the Future. Economics: The Open-Access, Open-Assessment E-Journal, Vol. 7, 2013-39.

Publication #13

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Eugene S. Takle, David Gustafson, Roger Beachy, Gerald C. Nelson, Daniel Mason-D'Croz, and Amanda Palazzo (2013). US Food Security and Climate Change: Agricultural Futures. Economics: The Open-Access, Open-Assessment E-Journal, Vol. 7, 2013-34. http://dx.doi.org/10.5018/economics-ejournal.ja.2013-34

Publication #14

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Liming Ye, Huajun Tang, Wenbin Wu, Peng Yang, Gerald C. Nelson, Daniel Mason-D'Croz, and Amanda Palazzo (2014). Chinese Food Security and Climate Change: Agriculture Futures. Economics: The Open-Access, Open-Assessment E-Journal, Vol. 8, 2014-1.

Publication #15

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Nelson, Gerald C.; Valin, Hugo; Sands, Ronald D.; Havlík, Petr; Ahammad, Helal; Deryng, Delphine; Elliott, Joshua; Fujimori, Shinichiro; Hasegawa, Tomoko; Heyhoe, Edwina; Kyle, Page; Von Lampe, Martin; Lotze-Campen, Hermann; Mason-d'Croz, Daniel; van Meijl, Hans; van der Mensbrugghe, Dominique; Müller, Christoph; Popp, Alexander; Robertson, Richard D.; Robinson, Sherman; Schmid, Erwin; Schmitz, Christoph; Tabeau, Andrzej; and Willenbockel, Dirk. 2013. Climate change effects on agriculture: Economic responses to biophysical shocks.Proceedings of the National Academy of Sciences of the United States of America p. 1222465110-http://dx.doi.org/10.1073/pnas.1222465110

Publication #16

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Nelson, G. C. and Shively, G. E. (2014), Modeling climate change and agriculture: an introduction to the special issue. Agricultural Economics, 45: 1–2. doi: 10.1111/agec.12093

Publication #17

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: von Lampe, M., Willenbockel, D., Ahammad, H., Blanc, E., Cai, Y., Calvin, K., Fujimori, S., Hasegawa, T., Havlik, P., Heyhoe, E., Kyle, P., Lotze-Campen, H., Mason d'Croz, D., Nelson, G. C., Sands, R. D., Schmitz, C., Tabeau, A., Valin, H., van der Mensbrugghe, D. and van Meijl, H. (2014), Why do global long-term scenarios for agriculture differ? An overview of the AgMIP Global Economic Model Intercomparison. Agricultural Economics, 45: 3–20. doi: 10.1111/agec.12086

Publication #18

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Robinson, S., van Meijl, H., Willenbockel, D., Valin, H., Fujimori, S., Masui, T., Sands, R., Wise, M., Calvin, K., Havlik, P., Mason d'Croz, D., Tabeau, A., Kavallari, A., Schmitz, C., Dietrich, J. P. and von Lampe, M. (2014), Comparing supply-side specifications in models of global agriculture and the food system. Agricultural Economics, 45: 21–35. doi: 10.1111/agec.12087

Publication #19

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Müller, C. and Robertson, R. D. (2014), Projecting future crop productivity for global economic modeling. Agricultural Economics, 45: 37–50. doi: 10.1111/agec.12088

Publication #20

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Valin, H., Sands, R. D., van der Mensbrugghe, D., Nelson, G. C., Ahammad, H., Blanc, E., Bodirsky, B., Fujimori, S., Hasegawa, T., Havlik, P., Heyhoe, E., Kyle, P., Mason-D'Croz, D., Paltsev, S., Rolinski, S., Tabeau, A., van Meijl, H., von Lampe, M. and Willenbockel, D. (2014), The future of food demand: understanding differences in global economic models. Agricultural Economics, 45: 51–67. doi: 10.1111/agec.12089

Publication #21

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Schmitz, C., van Meijl, H., Kyle, P., Nelson, G. C., Fujimori, S., Gurgel, A., Havlik, P., Heyhoe, E., d'Croz, D. M., Popp, A., Sands, R., Tabeau, A., van der Mensbrugghe, D., von Lampe, M., Wise, M., Blanc, E., Hasegawa, T., Kavallari, A. and Valin, H. (2014), Land-use change trajectories up to 2050: insights from a global agro-economic model comparison. Agricultural Economics, 45: 69–84. doi: 10.1111/agec.12090

Publication #22

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Nelson, G. C., van der Mensbrugghe, D., Ahammad, H., Blanc, E., Calvin, K., Hasegawa, T., Havlik, P., Heyhoe, E., Kyle, P., Lotze-Campen, H., von Lampe, M., Mason d'Croz, D., van Meijl, H., Müller, C., Reilly, J., Robertson, R., Sands, R. D., Schmitz, C., Tabeau, A., Takahashi, K., Valin, H. and Willenbockel, D. (2014), Agriculture and climate change in global scenarios: why don't the models agree. Agricultural Economics, 45: 85–101. doi: 10.1111/agec.12091

Publication #23

Type: Journal papers

CCAFS Themes: Theme 4.3

Citation: Lotze-Campen, H., von Lampe, M., Kyle, P., Fujimori, S., Havlik, P., van Meijl, H., Hasegawa, T., Popp, A., Schmitz, C., Tabeau, A., Valin, H., Willenbockel, D. and Wise, M. (2014), Impacts of increased bioenergy demand on global food markets: an AgMIP economic model intercomparison. Agricultural Economics, 45: 103–116. doi: 10.1111/agec.12092

4. Communications

Media campaigns:

Activity # 584-2013

Coordinated media campaigns between IFPRI, other AgMIP partners (PIK, IIASA, Columbia University) and CCAFS, for AgMIP special feature in PNAS and special issue of Agricultural Economics.

IFPRI Press Release on PNAS: http://www.ifpri.org/pressrelease/major-economic-models-climate-change-and-agriculture-point-same-direction-differ-magnit

Blogs:

Activity # 584-2013

1. PNAS special feature

http://www.ifpri.org/blog/merging-models-compare-food-security-impacts-climate-change

http://ccafs.cgiar.org/blog/new-study-models-where-agriculture-heading-under-climate-change#.UvA86vldWAi

2. Agricultural Economics special issue

http://ccafs.cgiar.org/research-highlight/agriculture-models-under-scrutiny-why-are-they-not-coming-together#.UvA_YPldWAg

Websites:

Communication material has been uploaded in several occasions either in IFPRI or CCAFS websites (see links attached in other boxes).

Social media campaigns:

Social media campaign on the AgMIP PNAS paper, organised by IFPRI, December 2013.

Newsletters:

no newsletters published

Events:

Activity 578-2013 hosted a midterm workshop to present project findings and get feedback on research plans for 2014 on December 9, 2013. Stakeholders from India, Ethiopia and Kenya traveled to DC to participate in the workshop.

Activity 580-2013 hosted a consultation workshop over 24-25 Oct 2013 to engage with key stakeholders in Burkina Faso to discuss the impacts and adaptation options for climate change, and a similar workshop was held on 5 June 2013 in Guinea. Activity 580-2013 followed up with a consultation on 17 Dec 2013 in Burkina Faso to discuss the initial sector reports for maize and cotton which describe the performance of those sectors and their key vulnerabilities to climate change.

Activity 577-2013: Brainstorming Workshop on "Community-based Insurance in Agriculture Conceptualization and Institutionalization of the Processes" was organised on March 12 2013 at IFPRI.

Conference on "Institutions and Polices for Scaling-out Climate Smart Agriculture" was jointly organised by CCAFS -IFPRI, Dec 2-3, 2013 at Colombo, Sri Lanka.

"Analyzing Countries' Human, Organizational and Systems Capacity and Policy Process to Proactively Respond to Impending Climate Change Challenges" (Additional activity, not reflected in the 2014 Activity Plan)
1.Stakeholder consultation for a system assessment to "Analyze Ghana's capacity to proactively respond to climate change challenges," Organized jointly by IFPRI and Ministry of Food and Agriculture; December 2013; Accra, Ghana. 2.Stakeholder consultation for a system assessment to "Analyze Vietnam's capacity to proactively respond to climate change challenges," Organized by local collaborator; December 2013; Vietnam. 3. Stakeholder consultation for a system assessment to "Analyze India's capacity to proactively respond to climate change challenges," Organized by IFPRI; December 2013; New Delhi, India.

Activity 587-2013: Presented IMPACT model improvements and the use of the model in Global Futures at "Modeling Wheat Response to High Temperature AgMIP Wheat multi-model comparison with Hot Serial Cereal experiment". Organized by CIMMYT. June 19-21 2013. Texcoco, Mexico

Activity 586-2013. Presented IMPACT, and scenario analysis tools. "ICT4Ag" Organized by CTA: November 2013. Kigali, Rwanda.

Videos and other multimedia:

no videos or multimedia were created

Other communications and outreach:

Presentations using the data from activity 585-2013:

Kovarik, Chiara (IFPRI). Presentation at AAEA & CAES Joint Annual Meeting on August 5, 2013: Gender Differentiated Adaptations to Climate Change: Preliminary Findings from East Africa, Washington DC

Haglud, Eric (IFPRI). Presentation at "BioSight/SustainableFutures" Project
December 4, 2013, Gender Dimensions of Agricultural Innovation Awareness and Adoption

Kovarik, Chiara (IFPRI). Presentation at Tropentag Conference, September 18, 2013, "Gendered Differences in Climate Change Adaptation: Implications for Rural Agricultural Systems"

Presentations related to activity 578-2013:

Tingju Zhu presented “Adaptation for Planting and Irrigation Decisions to Changing Monsoon Regime in Northeast India: Risk-based Hydro-economic Optimization” at the American Geophysical Union (AGU) Annual Fall Meeting on December 12, 2013.

Tingju Zhu presented “Water and Agricultural Adaptation Strategies for Megadroughts in the Indo-Gangetic Plains” at the 7th Annual UC Davis Water Management Workshop organized by the Center for Watershed Sciences at the University of California, Davis on December 14, 2013.

Hua Xie presented "IFPRI SWAT applications (ex-ante technology assessments, SA & SSA wide SWAT modelling, Indus drought analysis)" at the IWMI-Techies workshop in Kenya in June 2013.

Siwa Msangi presented the project overview and the proposed model methodology for Burkina Faso at the country workshop on 24 Oct 2013 ("Apercu globale des impacts du changement climatique" and "Impact du changement climatique sur l'agriculture et la securite alimentaire: Methodologie et resultats pour le Burkina Faso")

5. Case studies

Case Study #1

Title: Increaseing Women's Resilience to Climate Change

Author: Quinn Bernier, Eric Haglund, Claudia Ringler, Chiara Kovarik, Ruth Meinzen-Dick

Type: Social differentiation and gender,Capacity enhancement

Project description:

Development scholars are paying increasing attention to the aspirations, motivations, and values that drive behavior in agricultural environments. The "Increasing Women's Resilience to Climate Change Project" seeks to examine how these motivations and values vary between men and women and how they influence perceptions of climate change and the adoption of climate-smart agricultural technologies. In our efforts to design survey questions to collect this information, we relied on previous surveys and literature from the field of psychology, and also drew on Likert scale questions, in which respondents are read a statement and asked to choose a response among options that range from "strongly agree" to "strongly disagree". The process of choosing the precise phrasings of the Likert scale statements led to a lot of discussion in the survey design team of how to capture the exact sentiments we were interested in and how to avoid implying that there was a "right" or "wrong" response.

Introduction / objectives:

Upon arriving in the field to train enumerators, however, we found that we were less prepared than we thought. Terms and phrases that had seemed clear when we were designing the survey had no obvious equivalent in the local languages. We immediately recognized that translation—and careful attention to word choice—was going to be critical to ensuring the quality of the data collected.

Project results:

To ensure that translation was accurate and consistent, we developed a game to be played with the survey team. An enumerator picked one of the survey questions and offered a local language translation of the question. A second enumerator translated the question back as he or she had heard it. The group of enumerators then critiqued the translation and offered suggestions. We repeated this exercise until we all agreed on the best phrasing.It turned out to be a time-intensive endeavor, but one that was rewarding and fun—for both sides. For the survey teams, the challenge of taking concepts and terms that seemed clear to the survey design team and presenting them consistently in local languages led to some very lively discussions and helped establish team spirit. Enumerators remarked that this translation game had been particularly helpful and enjoyable. For us, it provided an insight into how some of these lofty terms are conceptualized and viewed on the ground and a useful reflection on how sensitive responses to surveys are to issues of language and phrasing.

Partners:
ILRI, IITA, DATA, ISRA

Links/sources for further information:

Case Study #2

Title: Low Emission Development Strategies in Vietnam
Author: Alex De Pinto, Man Li, Tim Thomas, Akiko Haruna
Type: Policy engagement,Breakthrough science

Project description:
The rational of this project rests in the idea that countries, in their pursuit of economic growth, can choose among a portfolio of growth-inducing technologies with different GHG emission characteristics. It is necessary for countries to utilize tools capable of analyses that are sector-wide, bringing together agricultural, forest, livestock. Furthermore, given that countries are part of a global economic system, it is critical that LEDS are devised based both on national characteristics and needs, and full recognition of the role of the global economic environment.The general goal of this project is to create that tool. To capture the complexities of these interactions, the modeling components include a spatially-explicit model of land use, which captures the main drivers of land use change, and the core IMPACT model, a global partial equilibrium agriculture model that allows policy and agricultural productivity investment simulations, and process based modeling tools for the simulation of yields and GHG emission.

Introduction / objectives:
Create a modeling framework that can integrate global changes in economic drivers, spatially-explicit characteristics, and interaction between forest and agriculture.Provide participating countries with the information necessary to make decisions about the agricultural sector growth and targets account in full for GHG emissions and changes in carbon stock.

Project results:
We estimated an accurate baseline for emissions deriving from the agriculture and forestry sectors for the period 2009 - 2030. Results reveal the importance of considering the full scope of interactions and changes in the various land uses when planning for GHG reduction policies. This is particularly true for the forest-cropland interface. Vietnam has implements relatively successful forest protection policies and the carbon stock stored in forests often overwhelms the possible increases in GHG emissions generated by food crop production as shown in our results. We also evaluated the adoption of of alternative practices in rice cultivation. Overall results show that significant reduction of emission is possible but at the expenses of revenues from crop production. Tradeoffs clearly need to evaluated when determining emission reduction policies.

Partners:

ICRAF (Vietnam), National Institute of Agricultural Planning and Projection (NIAPP), Institute for Agricultural Environment (IAE).

Links/sources for further information:

http://www.slideshare.net/IFPRI-EPTD/leds-training-9-913?utm_source=slideshow&utm_medium=ssemail&utm_campaign=post_upload

Case Study #3

Title: Midterm Workshop for the Project "Investigating the Impact of Climate Extremes on Future Water and Food Security"

Author: Elizabeth Bryan, Tingju Zhu

Type: Successful communications,Policy engagement

Project description:

Extreme weather events, such as droughts and floods, cause enormous damage in South Asia and East Africa, in particular to agricultural production and rural livelihoods. Climate projections suggest that more frequent and severe weather extremes are expected in the future under climate change. Enhancing farmers' coping capacity and improving agricultural and water policies will increase the resilience of rural communities towards both today's and future climate extreme events. On December 6, 2013, IFPRI hosted a workshop in Washington, DC to present preliminary research results from the CCAFS-supported project "Investigating the Impact of Climate Extremes on Future Water and Food Security" and to get feedback from senior researchers and policymakers working on issues related to climate extreme events from India and East Africa.

Introduction / objectives:

The workshop was planned as an event for the project team to present preliminary results from the various components of the ongoing project, such that the invited participants from India and East Africa could review those results and provide feedbacks. In addition, research plan for year 2014 was also presented and discussed, and useful comments were provided by invited participants.

Project results:

Several presentations focused on the severity and frequency of drought in South Asia, identifying vulnerable areas and prioritizing drought mitigation measures. Results for Pakistan show that droughts exhibit cyclical behavior in which periods of intensive droughts, covering key agricultural areas of the country, appears to occur approximately every 16 years. Results for India show that increasing temperature during wheat growing months hurts crop yield more significantly than changes in rainfall. Additionally, a hydro-economic model is set up to analyze effective coping strategy for planting and irrigation with delayed monsoon, in the State of Bihar of India, where land fragmentation and high production costs prevent small farmers from taking effective drought

mitigation actions. Results obtained from the second round survey of households in the Nile Basin of Ethiopia show that climate shocks, particularly droughts and hailstorms, continue to have a negative impact on the livelihoods of poor rural farmers, with major effects on crop production, income, and consumption.

Partners:

University of Illinois at Urbana-Champaign

Links/sources for further information:

6. Outcome indicators

Outcome indicator:

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

Achievements:

IMPACT Model has been redesigned and improved to meet the demands of model users and collaborators. The new version of the model is being used by collaborators in other CGIAR centers, and is also being used by the OECD Agriculture and Fisheries Division for reports on climate change and agriculture.

Evidence: