Household level modelling in CCAFS and other CRPs: Moving from ideas to action

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Workshop Report

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Mark T. van Wijk

Photos: CCAFS

Abstract

Across different CGIAR centres there is a strong interest in applying farm household models to evaluate and target adaptation to climate change and variability. The Commonwealth Scientific and Industrial Research Organization (CSIRO), an important research partner for the CGIAR Research Program (CRP) on Climate Change, Agriculture and Food Security (CCAFS), has developed into a top institute in this research area, and has strong interest in strengthening collaboration with CCAFS and other CRPs like Integrated Systems for the Humid Tropics. In recent years CCAFS and Humid Tropics have invested a lot of time and effort in collecting farm household level characterization data and in developing coherent socio-economic scenarios of change in the near future. Given the current interest in household level analyses of adaptation and mitigation options, and the availability of data and resources within CCAFS and other CRPs the aim of the workshop was to develop a community of practice across CGIAR centres and stimulate active CGIAR – CSIRO collaboration, thereby more effectively sharing and further developing the wide range of tools and approaches available in the different institutes. The workshop, besides exchanging information about new results of on-going work and sharing of approaches and methods also produced a flexible and stepwise work plan that could be implemented under different scenarios of available funding.

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Acknowledgements

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Introduction

Across different CGIAR centres there is a strong interest in applying farm household models to evaluate and target adaptation to climate change and variability. CSIRO, an important research partner for CCAFS, has developed into a top institute in this research area, and has strong interest in strengthening collaboration with CCAFS and other CRPs like Integrated Systems for the Humid Tropics. In recent years CCAFS and Humid Tropics have invested a lot of time and effort in collecting farm household level characterization data and in developing coherent socio-economic scenarios of change in the near future. Given the current interest in household level analyses of adaptation and mitigation options, and the availability of data and resources within CCAFS and other CRPs, the aim of the workshop was to develop a community of practice across CGIAR centres and stimulate active CGIAR – CSIRO collaboration, thereby more effectively sharing and further developing the wide range of tools and approaches available in the different institutes. The workshop builds on earlier meetings, like the CCAFS household modelling workshop in 2012 in Amsterdam (see Van Wijk et al 2012), the CCAFS Trade off Analysis workshop in Wageningen in 2013 (see Klapwijk, 2013), and the HumidTropics Farming Systems analysis workshop in late 2013, also in Wageningen (report forthcoming). The workshop described in this report wanted to go a step beyond the earlier workshops by making action an explicit goal and by inviting many young and promising scientists in early stages of their respective careers, to ensure hands are available to take the plans and ideas developed during the workshop forward into concrete action. The workshop aimed at, besides exchanging information about new results of on-going work and sharing of approaches and methods, producing a flexible and stepwise work plan that could be implemented under different scenarios of available funding.

Workshop Activity Description

Day 1

Program Day 1

9.00– 9.15	Short intro Mark van Wijk, ILRI: Welcome and introducing the goals of the workshop
9.15 – 10.15	Intro round participants (institute, background, why interest in HH modeling workshop, what do you want to get out of the workshop)
10.15 – 10.30	Short presentation of the vision of CCAFS on the role of HH modeling: Theme 2 (Jim Hansen, CCAFS) & Theme 4 (Philip Thornton, CCAFS)
10.30 – 11.30	Coffee break
11.00 – 11.45	Ongoing CCAFS HH modeling activities I: Across site HH intervention analysis using Impact-lite and other data sources (Mark van Wijk, ILRI)
11.45 – 12.30	Ongoing CCAFS HH modeling activities II: Zooming in: detailed HH level studies and trade off analyses (Cyrille Rigolot, CSIRO)
12.30 – 14.00	Lunch
14.00 – 14.20	Position presentations I: HH modeling in a participatory manner: some ideas (Piet van Asten, IITA)

14.20 – 14.40   Position presentations II: From small plots to large impact (Jacob van Etten, Bioversity)

14.40 – 15.00   Position presentations III: From plot to farm, and back again (Marc Corbeels, CIRAD)

15.00 – 15.20   Position presentations IV: HH modeling and diversity? How useful is HH modeling to develop portfolios of interventions rather than single silver bullets (Maarten van Zonneveld, Bioversity)

15.20 – 15.45   Coffee break

15.45 – 16.05   Position presentations V: Uncertainty, variability, risk and resilience: what could/should HH models do? (Jim Hansen, CCAFS)

16.05 – 16.25   Position presentations VI: Multi-scale analyses: a thinking framework, and how HH and other modeling approaches can fit in (Santiago Lopez-Ridaura, CIMMYT)

16.25 – 16.45   Position presentations VII: Interactions between farmers: the usefulness / uselessness of multi-agent models (Diego Valbuena, CIAT)

16.45 – 17.05   Position presentations VIII: Decision making: what can HH models do? (Thomas Allen, Bioversity)

Summary of the presentations

After the introductory presentations, Mark van Wijk (ILRI) presented in the first content focused presentation a simple analysis to assess the potential of alternatives for achieving goals at the farm household (FHH) level: food self-sufficiency, food security and simple nutrition indicators were used. This can lead to better strategic thinking on where to invest/target for achieving outcomes. These were simple calculations, and could be in conflict with capturing the complexity of FHHs and their diversity. The approach might be used to assess poverty traps in the face of thresholds or tipping points. Development of retrospective assessment databases or analyse specific FHH will be needed to see trajectories of change, rather than presenting static pictures.

Cyrille Rigolot (INRA/CSIRO) showed a FHH (nested) simulation model to assess climate change/crop management effects on overall farm profit. These were detailed analyses with a lot of information about variability and the robustness of interventions against the background of a variable and changing climate.

Piet van Asten (International Institute of Tropical Agriculture (IITA)) presented a short overview of the history of agricultural systems research in the CGIAR since the 60s, and placed recent developments in participatory approaches in a historical perspective. Participatory approaches at different levels are key to achieve impact, but especially the initial stages of gaining trust and setting up discussion platforms can be time-consuming. However, once set up these platforms can run very smoothly. It is important to work with agents of change and Piet introduced simple FHH model approaches (e.g. fuzzy cognitive mapping) to be able to communicate to/among stakeholders/users regarding model results.

Jacob van Etten (Bioversity) presented ideas around integrated research design to be able to achieve impact. Focus is on simplification, but unfortunately simplification is not simple.

Methods and analysis were presented using crowd sourcing, achieving big data through simple methods.

Marc Corbeels (Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)) focused on cropping systems models and how they can be used in FHH models. It is important to reduce complexity when moving up in scales and simplification of processes are needed. Identify of key drivers/determinants for adaptation to climate change is needed in order to identify which process representations can be simplified. It is an art to find the right level of complexity, and to engage local agents/farmers in modeling exercises.

Maarten van Zonneveld (Bioversity) presented ideas for how FHH models can be used for agents, land planning and to define portfolios of solutions. FHH models should be used to test baskets of solutions and to identify what fits where. An approach in which FHH models can be used effectively is the progressive selection of best bets.

Jim Hansen (CCAFS) presented ideas around resilience and poverty traps. Key issues are how to measure resilience/transformability and how to operationalize the concepts on the ground. Jim Hansen presented ideas how this could be implemented in FHH models through simulations of stochastic model realizations in time. A wish list of model characteristics was presented to be able to deal with risk, resilience and stochasticity, which was then refined into a practical stepwise plan for model development.

Santiago Lopez Ridaura (International Maize and Wheat Improvement Center (CIMMYT)) presented is ideas around multiple scale level analyses. He formulated this in terms of a framework as opposed to a specific set of methods. Soft coupling of different model approaches is seen as essential to be able to keep complexity under control, and it is important to link science and communication tools. He aims to develop the framework forward and apply it in collaboration with other partners.

Diego Valbuena (International Center for Tropical Agriculture (CIAT)) presented methods and ideas regarding multi-agent models. A set of practical guidelines for use on the ground (board games/models) was shown which through agent-based models can be formalised in terms of the interactions between agents. Progressive change or shocks and how agent based models can analyse these was also briefly discussed.

Thomas Allen (Bioversity) presented his view on how decision-making is currently modelled in FHH models, and which are the strong and weak points of current approaches. Intra household decision-making is important (especially in relation to gender related research questions) but is not easy to represent. The importance of the definition of objective functions was stressed, as well as ideas around the analysis of the drivers of behaviour.

Day 2

On Day 2 breakout groups of 4-6 persons were formed and each group was asked to evaluate the presentations of the first day, discuss and list the topics of most interest that were presented in Day 2, and state clearly why each group was interested in these topics. Each group needed to order the topics on what pragmatically can be achieved in 2014/2015, and in

the end during a plenary session present the 3-5 chore topics that scored highest in terms of interest for the group members.

After the plenary session 5 key topics were defined:

1. Scaling: scale integration, up and downscaling;

2. Analysis and modelling of decision making for improved adoption: better understanding leading to better prediction;

3. Data: rescue, gathering, new approaches (e.g. crowd sourcing);

4. Participatory approaches: what, where, how, with and for whom; and

5. Dealing with diversity, heterogeneity and uncertainty, participatory approaches, scaling, data, decision making.

New breakout groups were defined per topics, and each group needed to discuss in more detail what can be achieved on the issue in 2014/2015:

*   For which systems/regions/sites progress in issue would really make a difference and why?

*   How can it contribute to outcomes (how is it useful, for whom)?

*   What is the way forward? What do we need/ want to achieve in 1/2 - 5 year time?

*   What are current constraints?

*   What actions are needed for this?

*   What are the partnerships needed for these actions?

*   How can we get those partnerships in place?

After discussing for 1.5 hours the groups presented their views in a plenary session. The breakout group on 'scaling' started with presenting the context in which scaling is an important issue. While the global scale community works on climate change impact, land use change and mitigation targets, the local scale community works at farm and field level on crop improvement, management technologies and modelling of household level interventions. There is a missing link between these two communities and research approaches and there is a large opportunity to work on an intermediate scale. The CG Centers have a comparative advantage in this arena with experts on both side of the divide, and there is a great potential for outcomes if local analyses can feed into global community approaches. The niche of the CG is the knowledge on crops and livestock, in combination with modelling skills in place. Results of intermediate level analyses can feed into national policies. The contribution of the intermediate level research is to support national policy development (Nationally Appropriate Mitigation Actions, National Adaptation Plans) and improve global assessments by supplying ground-truthing of results. An example project could focus on conservation agriculture, taking on board crop expertise and targeting exercises, and combine these to improve policies (cheap water, subsidize machinery). Some constraints currently in place are problems surrounding data sharing, time and human resources available, pieces of missing information (e.g.

economics), availability of political capital, missing information layers and our still relative lack of understanding regarding the functioning of landscapes. Options to alleviate these constraints are the use of crowd sourcing, putting in place novel partnerships, appoint shared positions with governments, form inter and trans disciplinary teams, play more golf with decision makers and try to better understand policy process and power relations.

The 'data' breakout group assessed ways to proceed rapidly and achieve quick wins. Elements that were discussed were crowdsourcing, which is of critical importance for data that we cannot get from usual data sources. We should embrace proxies as a powerful to proceed rapidly, and in the CG we are quite good in using them. An AgTrials for household data should be set up while on a less ambitious level annotated "bibliographies could be developed and improved inventories and dummy's guides to access and use datasets. The first aim should be to go for big datasets; they normally represent low-hanging fruits to achieve outputs and outcomes. There is money for making data compatible, for example with the Bill and Melinda Gates Foundation, and European datasets have been combined already: they could be a model to follow. For the future of household level surveys we should think of crowdsourcing and outsourcing to be efficient, and to use sensors to collect data cheaply. An example project could focus on technology adoption (why and where does it take place?), on quantifying how many poor smallholder farmers there actually are and where and on interrelating gender, vulnerability, diversity, food security and food production, with a strong link to health.

The breakout group focusing on participatory modelling discussed the importance of the approach to make sure you focus on issues that are relevant for the key actors in the system – it can serve as an important reality check. The approach can accelerate the household modelling research by iterative adaptation of model based on feedback and co-learning. Important aspects are 'Keep it simple, stupid' (KISS, 1960) – simplicity should really be a goal. In principle you do not need big numbers, but need relevant representative actors. It is important to develop / use / test simple engagement/learning tools, for example role-plays / board games. Which one you chose will depend on the actors present and the issues at stake. Important elements are also negotiation, confronting, and the explaining of perspectives of different actors. Use simple models that embrace complexity and that evolve through iterative learning rather than by building complexity in the model itself. Participatory approaches are relevant from inception to scaling out, so in all stages in projects. The steps forward defined by the group are the following:

1. Write a review paper on household modelling – lessons on effectiveness (=outcome and impact) and how participatory tools/approaches contributed to that.

    -   Literature review – what was done, which groups, what tools, what successes?

    -   Expert consultations (-> cross-check success stories with implementers).

    -   Two MSc's (lit review) and 1 expert -> budget 80-100k USD

2. Develop a toolbox

    -   Synthesis & guidelines – we need 30k USD

    -   How to connect participatory and modelling approaches – plug in

- Minimum dataset needed for HH modelling when using participatory approached for data collection.

- Table of what tools work best when and where.

3. Validate current results from HH surveys and HH modelling to farming communities (and possibly other actors). Next 0.5-2yrs.

- IMPACTlite – planned for West Africa and East Africa (work led by Sabine Douxchamps and Silvia Silvestri, et al.);

- CCAFS-FP4 East Africa – link (Piet van Asten et al.);

- BMZ + USAID – project (Laurence Jassogne et al.);

- Farmer groups set up Humidtropics in Uganda (and with Lotte Klapwijk and Sabine Douxchamps interested to 'copy' the approach in West and Central Africa).

4. Upscaling and outscaling:

- Guidelines on how to best report back;

- Guidelines on how to best engage with agents of change;

- Document the learning process in existing projects to move towards guidelines.

Existing constraints to make progress in participatory modelling approaches are a negative attitude towards participatory approaches, often determined by wrong perceptions, with scientists looking for excuses not to interact and to stay in their safety zone. Some scientists are worried to be confronted with reality, and it is true that participatory research is risky – it's not for old people! The perception that participatory approaches are time consuming is not true. It is so at the beginning, but this is unavoidable, but can speed up substantially in later stages. It is important to go for clear methods and simple tools, so it is essential that we quickly get a toolbox in place. You don't need large numbers for this, just pick your groups right, and once you show the evidence of the effectiveness it will accelerate research. Key is that scientists do not only start interacting after they got their results, they need to engage from the START, and CCAFS management should make it obligatory in the projects they fund! In terms of partnerships, identification of change agents is key. Get their buy-in – build trust and ownership of process and results. Public officers are notoriously slow, incentive-dependent, but there is no way around them, we need them. In the case of weak government agents this actually presents an opportunity, we could engage to build capacity. For all of this to happen it is important to build multi-disciplinary teams and bring social scientists on board. Maybe CCAFS can encourage cross-centre and cross-continental initiatives, for example to get teams together for 2 weeks to work on approaches and developing the toolbox. Opportunities are there in the use of mobile phones – set up crowd sourcing to get feedback from community and other new communication tools.

The group on decision-making focused on developing a generic application, with the overall aim to understand decision-making to increase adoption (so this is of course not necessarily restricted to modelling exercises). The short-term idea is to do a scoping-study, which should be strongly linked to work planned in the participatory modelling workgroup. This could lead

to longer-term work in which farm field schools are set up to study the adoption-process and its drivers. Constraints discussed were that this type of work is time-consuming, will need multiple questionnaires and follow-ups, and can be demotivating for the farmers if it is not well set up, and leads to direct information feedback to farmers. Capturing the decision-making process in a model is basically impossible; we can only approach it from different angles and see the consequences. Remaining research questions focus on the degree of simplification needed when describing farm household level decision making (is each farmer different?), how / where / when can we add the gender-aspect, this also in relation to what we actually expect from household level modelling with regard to decision making. Opportunities lie in making better use of experts (sociologists, marketing researchers).

The breakout group on diversity and uncertainty first discussed the issues at hand. Uncertainty is a key concept given that farmers and policy makers have to make decisions now about a future that is changing because of higher stochasticity in weather events. Diversity on the other hand deals with spatial heterogeneity, different types of farmers and farms, all with the aim to better target interventions. Diversification is again another term, and looks at options at farm level to better cope with uncertainty. Analyses of how to target interventions are based on the assumptions of the models, while modelling variability and uncertainty in time and representation of spatial variability are important. Ways forward in place are the USAID funded project in Senegal, where different ways of describing diversity among farms will be used a trade-off analysis (TOA/MD) to assess risk insurance options, and analyses of existing data (e.g. CCAFS ImpactLITE) on comparing needs, decision-making and potential interventions across different agro-ecological zones in three countries in West Africa. Regarding uncertainty and household modelling it will be important to develop stochastic models to consider uncertainty and risk in weather, prices, and diseases and develop discrete scenario. This will help us to identify boundaries where agricultural systems are going to change drastically. It will also help us to quantify how much confidence we have in the likelihood that different interventions are effective under different scenarios? Sensitivity analyses can help us to target crucial components in a diverse farm and across diverse farms by identifying what the most important and most climate change sensitive farm activities are. Questions still exist around how we represent farmer types, which components should be included and the optimal level of simplification. Perhaps participatory research can help in answering these questions in a way that modelling activities are relevant for particular systems.

Day 3

Mark van Wijk started Day 3 of the workshop with a short overview of what happened during the workshop. Where Day 1 focused on an overview of analyses and approaches, in Day 2 the group tried to go towards action plans by defining the main research topics of interested (a methodology oriented discussion). This led to some generic plans of actions for those research topics in the afternoon Day 2.

However, by separating by research topic the group ran the danger of splintering activities and losing sight of the overall picture of model analyses in certain regions and systems in which the participants are working. The sessions on Day 2 were not very successful because the connection with the real systems was lost. Furthermore, a key question for continued

funding of farm household modelling related activities was not answered during the first 2 days: how can farm household modelling / analyses contribute to achieving outcomes?

During the intro presentation of Day 3 Mark van Wijk presented his ideas on how modelling can lead to or support achieving outcomes. Summarizing his idea was that household level modelling creates essential information to better inform:

• Policy makers (targeting, what kind of impacts can be expected, where best to invest);

• Local extension, NGOs (targeting, realistic assessment of potential of interventions, what can work where for which farmer); and

• Local farmer groups about best-bet management options in participatory approaches.

His general statement was that modelling in itself will not lead to outcomes, but can play an important a servant role to generate them. This idea was first discussed in a 1-hour session where the participants tried to develop impact pathways, and placed modelling activities within that pathway. Overall the view was that the original conception of household modelling and achieving outcomes was ok, but needed adaptation:

1. Household level modelling can lead to direct outcomes at policy development level, whereas at local and farm level its role is indeed indirect

2. The three levels distinguished in the introduction presentation of Day 3 are not enough, between policy making level and local level there are several other integration levels, like regional NGOs regional policy making, etc. that need to be mentioned

Based on the discussions of Day 2, which were per topic, on Day 3 the participants continued by forming groups per region, and discussing per region a list of core activities. Per region the breakout groups needed to develop an overall roadmap under 3 scenarios of cash availability:

• Current projects in place / starting up ($0 extra cash);

• Seed money available (up to $50k – $100k); and

• Bigger cash available.

For this the breakout groups discussed/answered the following questions:

• What are the priorities?

• Where are the quick wins?

• How can HH modelling assist in achieving the outcomes you are looking for in the region

• Develop a stepwise work plan with HH modelling / analyses based achievements (realistic!) for 2014 – 2015- 2016.

These breakout groups were also the same ones that earlier discussed the impact pathways for the different regions, and how household level modelling can generate outcomes.

Group leadership was assigned on this day:

• Latin America: Diego Valbuena and Maarten van Zonneveld;

- West Africa: Katrien Descheemaeker;

- Central and East Africa: Piet van Asten;

- Across region work: Robert Hijmans

The Latin America group defined as the key priorities for the region the improving the available set of indicators of food security indicators, and improve their assessment at household level, to improve climate related management at farm level, and to improve intra-household level analyses to better address gender related issues. This should lead to overall better food security monitoring programs in Central America that support short-term adaptation and long-term investment of farm households. Next steps envisaged are building on the planned CCAFS Flagship 2 food security monitoring activities in Guatemala and Nicaragua. The quick wins identified were:

- Collaboration with national food security monitoring program in Nicaragua;

- Understanding relationship between climate & weather patterns and seasonal hunger;

- Improvement of monitoring systems by engagement with ECHO and NGOs like CARE and ACF who work already on Disaster Risk Reduction; and

- Use CATIE MAP data, CCAFS and Humid Tropics ImpactLite data.

Within the current setting MSc students could do a lot of the work (assuming the 0 extra money scenario), and maybe another PhD student (besides the one starting in the CCAFS theme 2 program) can be squeezed out of other funds available.

The West Africa group had as priorities to identify and target Climate Smart Agricultural (CSA) technologies and identify what is currently promoted, to assess what would make sense in the long-term. CSA technologies are typically site-specific, and within CCAFS in several West African meetings a list of technologies, identified by local actors, was set up:

- SWC measures (including Conservation Agriculture, manure application, green manure);

- Agroforestry;

- Vegetable gardens;

- Improved varieties;

- Fertilizer application;

- Small ruminants;

- Diversification.

All identified techniques are quite technical and agronomy focused. Not yet included are items like market development climate services, index based insurance and management of crop planting dates. Using models like IAT, calibrated for virtual farms, we can model the impact of improved practices on productivity, food security and income. New work should start around risk first. Assessing the probability distributions of yields and gross margins is key, thereby allowing the assessment of trade-offs between risk and returns, and the risk of

non-responsiveness. We can then also assess the value of supplying seasonal forecasts in terms of minimizing risk. Also needed is quantification of the benefits of diversification in relation to reducing risk; we can use crops that can be modelled in APSIM as a start. Second, for the simulation of the results of different futures we can tap into existing scenarios for the region to construct future farm system characteristics. Third, models like IAT should be compared to analyses produced by more simple tools, to see if data demands and complexity can be reduced. Fourth, participatory work should be set up, and modelling tools and their outputs should be tested with and by farmers. Under the no extra cash scenario collaboration between existing projects can already be improved, for example between the AgMIP-CCAFS project (funded by USAID) and analyses Sabine Douxchamps and Cyrille Rigolot will perform under CCAFS and CSIRO funding. Under the seed money scenario several people in the region should follow short courses on farming systems analysis and modelling. Under the full funding scenario the participatory ideas can be fully developed and executed.

The Central and East Africa group continued work on embedding household modelling and analysis approaches within participatory approaches to ensure the modelling approaches capture the right issues at hand and generate as outputs indicators that are relevant to local stakeholders. They see great potential of using modelling approaches, ranging from simple back-of-the-envelope calculations to more complex trade off analyses, in existing projects in the region, for example the HumidTropics program, the new CCAFS East Africa Flagship 4 project led by IITA and CIAT, the CIALCA II project in Central Africa and in a BMZ – USAID funded project led by IITA in Uganda. In all cases there are quite large databases of existing household level surveys available, or are being collected at the moment, which gives good scope for rapid advancement. Key activities foreseen within a no or very limited extra budget scenario are:

1. Organising a hands-on workshop on household level data analyses and modelling in Kampala for team members across the projects mentioned before. This is the first concrete output of the workshop, as it will take place on the 7th of June 2014.

2. Write a review paper on household modelling – lessons on effectiveness (=outcome and impact) and how participatory tools/approaches contributed to that.

    a. Literature review – what was done, which groups, what tools, what successes?

    b. Expert consultations (-> cross-check success stories with implementers).

    c. Two MSc's (lit review) and 1 expert -> budget 80-100k USD.

3. Develop a toolbox:

    a. Synthesis & guidelines – we need 30k USD.

    b. How to connect participatory and modelling approaches?

    c. Minimum dataset needed for HH modelling when using participatory approached for data collection.

For the general, worldwide group the priorities and quick wins are focusing on the development of a worldwide homogenized household level data set. This would allow scaling up of household modelling, and enable global assessments of food security. It's important to

quickly show how useful a global dataset could be and why it is so important. Two work packages were defined, together with the associated costs. Work package 1 would concentrate on an inventory of household level data. Estimated time and costs are 3 months and 10 000 USD, leading to an inventory of household surveys in time and space and identification and description of who, where, years, objectives, variables/ modules (possible sources and partners are IFAD, World Bank, CG centres, FAO). A second step in work package 1 would be to pilot the possibilities for data harmonisation. Estimated time would be 6 months with an associated cost of 20 000 USD. Key steps in this piloting exercise would be to choose a data rich region, harmonize the data, identify common or translatable variables, make strong assumptions for merging datasets, cross validate the data within the datasets and with census data and perform consistency checking (caution is important with the sampling procedure used!). Maybe the Bill and Belinda Gates Foundation could an option to check for funding. Work package 2 would focus on the up scaling exercise. The approach suggested would take an intervention (for example Conservation Agriculture (CA)). With the use of farm household level models target farmers can be identified and locally adapted version of Conservation Agriculture can be developed. These can be scaled up to the region and the potential impact of the intervention (in this case Conservation Agriculture) can be assessed. The time needed for this exercise was estimated at 2 years with a total cost of 100 000 USD.

Conclusion

The workshop, besides exchanging information about new results of on-going work and sharing of approaches and methods, produced a flexible and stepwise work plan that could be implemented under different scenarios of available funding. Given the current funding situation of CCAFS it is not easy to find money for modelling related activities, but the workshop clearly showed that already with small pockets of money significant steps forward can be achieved, especially when linking activities to existing projects in place in the different regions. All participants agreed on the usefulness of household level modelling for both strategic and practical purposes, and a clear commitment of the participants was shown to take this work further, either within or outside of CCAFS funded activities. While modelling has always been seen as a more strategic research oriented activity, this workshop clearly demonstrated approaches and practical ways forward of how modelling activities can be well embedded in more participatory and action oriented research.

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Appendix: Participants

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