

Management response to the external evaluation on:

Theme 3: Low Emissions Agriculture 2011-2013

March 2, 2015

CCAFS Program Management Committee

Background

A review was undertaken by Gordon Smith¹ (EcoFor) to examine how well the CCAFS' Theme 3 Low emissions agriculture program has achieved its objectives and deliverables, including the delivery of "International Public Goods" and development outcomes. The review addressed the program years 2011-2013.²

The goals of the Theme 3 (T3) program in 2011-2013 were to:

1. Inform decision makers about the impacts of alternative agricultural development pathways in at least 20 countries.
2. Identify institutional arrangements and incentives that enable smallholder farmers and common-pool resource users to reduce greenhouse gas emissions and improve livelihoods in at least 10 countries.
3. Test and identify desirable on-farm practices and their landscape-level implications, with the outcome that key agencies will deal with climate mitigation in at least 10 countries, promoting technically and economically feasible agricultural mitigation practices that also benefit resource-poor farmers.

In 2011-13 the program undertook more than 150 activities, and each activity had one or more work products.

The main findings of the review are summarized in Box 1. Here the focus is on CCAFS' response to the recommendations. In 2015, Theme 3 has been renamed Flagship 3.

Box 1: Main Findings

- The Theme 3 program is generally relevant to the program goals and objectives. However, some gaps exist (better articulation of pathways out of poverty, improved analysis of how to achieve higher rates of adoption and welfare increases, better data on why farmers innovate, attribution of outcomes to program difficult to ascertain).
- The program is generally effectively managed.
- The program operation is efficient, and management and transactions costs of the program are low.
- It is too soon to make a definitive statement about the impact of the program, but it appears that the impact is moderate relative to the scale of the resources applied to the program. Some activities are high impact and some appear to have little impact.
- It appears that many of the outcomes of the program will be sustainable. The quality of the science of a few outputs is very high. There are a fair number of science outputs that are solid science but that are not high impact.

Recommendation 1: CCAFS Theme 3 should clearly articulate a vision for a pathway or pathways where hundreds of millions of food insecure smallholder farmers can escape from poverty. This escape likely will involve transitions, over a few decades, to non-farming

¹ The original review team included Himanchu Pathak (Indian Council of Agricultural Research), who had to withdraw soon after the review was initiated. As result, the review did not cover the full scope of work. The main change was a reduction of field visits from two regions to one.

² The program was created in mid 2010 and the CCAFS "Themes" became operational in 2011. 2013 is the most recent complete year, and in 2014 the program is reorganizing and changing priorities (switching from "Themes" to "Flagships").

livelihoods, high value agricultural products, and larger scale farming.

This recommendation addresses a larger scale set of concerns relevant to the CGIAR as a whole and the CCAFS program secondarily. Theme/Flagship 3 however can address its contribution with a vision statement, which has been posted on our website:

Flagship 3 seeks to improve low emissions agricultural development options, which involves finance of transformative new practices that support sustainable intensification and increasing efficiency of production, both of which lead to higher economic productivity and access to markets for more sustainable products.

To increase our impact on the climate, we prioritize systems with high mitigation potentials, such as avoided deforestation, livestock, paddy rice and nitrogen fertilizer management, which involves a range of large and small producers in different trajectories of development. We model future scenarios of these trajectories that indicate trends towards higher value products, larger scale farming and more off farm livelihoods and migration that may support transitions out of poverty for large numbers of farmers, but also need to be monitored and guarded to avoid the risk of further marginalizing some groups.

With this recommendation the reviewer raises the important issue of what is actionable within the mission and scope of T3, CCAFS and possibly even the CGIAR to address poverty outside of the agriculture sector. By implication he suggests that a vision that recognizes more macro conditions related to, for example, education, asset accumulation, land, markets, scales of production and access to other incomes is needed. We suggest that in the better-off countries and farming areas with an interest and capacity for LED, T3 is likely to have less of an impact on rural poverty than other macro conditions related to overall economic growth, rural infrastructure, health and education. In the Extension Phase, CCAFS will conduct business case analyses that consider the opportunity cost of inputs and alternative livelihood choices to acknowledge these other opportunities.

For many smallholder farms, for which we seek to improve emissions estimates, this work will not contribute to poverty alleviation, but rather environmental aims.

Recommendation 2: CCAFS Theme 3 should continue with efforts to develop emission factors and inexpensive methods for assessing nitrous oxide emissions from a variety of smallholder farming vegetation types, management practices, and soil conditions, including emission rates several years after practice changes. Nitrous oxide emission generation is complex and nonlinear, and estimates and models for emissions resulting from climate smart agriculture practices could be wrong by a significant amount. We need to reliably estimate the net greenhouse gas effects of the land management changes we are proposing.

Flagship 3's vision is to follow the pathway outlined for improving estimates in our quantification syntheses (see Olander and Wollenberg, Environmental Review Letter special issue 2014), namely to conduct intense measurement campaigns that enable improved calibration of models that enable better estimates and identification of mitigation strategies. Data and models will be shared on global platforms. CCAFS is presently in communication with the GRA to link the SAMPLES and MAGGnet databases.

For N₂O will continue over 2015 to 2018 with N₂O measurements in a series of field trials

led by CIMMYT and 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.

In addition, CIMMYT 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 CIMMYT 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.

Some measurements of N₂O reductions from improved pasture management and use of Biological Nitrification Inhibitors (BNI) in Colombia is likely to be undertaken by CIAT during 2015 to 2018, pending decisions on treatments and measurement priorities (trade-offs will exist with measuring livestock enteric fermentation emissions).

Recommendation 3: CCAFS Theme 3 should increase the measurement of the effectiveness of interventions with smallholder farmers and policy makers, and ensure that measurement of effectiveness is incorporated in all capacity building and policy change activities undertaken by CCAFS, and this work should be done comparatively in multiple countries. Measuring the effectiveness of different interventions is different from impact evaluation. It is to assess what interventions work better. "Climate Smart Villages" are a promising venue for conducting much of this work on effectiveness of interventions.

This recommendation will be addressed with clear articulation of treatments and interventions for assessment in each of the Flagship 3 regional projects. Results-based management using outcome indicators and implemented in 2014 will also address this recommendation.

Recommendation 4: CCAFS Theme 3 should dramatically increase the quality of financial analysis of returns to different smallholder farming practices and systems, including comparisons of alternative systems. Cropping systems that increase yields or make yields more reliable won't be broadly adopted if the increase in costs is greater than the increase in benefits, relative to conventional systems.

In the current flagship phase, each major project includes analysis of the feasibility of interventions and their attractiveness for smallholder farmers, including women and different categories of producers, where relevant. In addition, a major activity on the business case for mitigation practices and their monitoring will be undertaken in 2015 to follow this recommendation and integrate better financial analysis in an initial four countries. A report will be produced on the current business case for alternative practices that lead to reduced GHG emissions at the farm level, including

- incentives needed for farmers and national level finance for:
 - mitigation in paddy rice in Vietnam and Bangladesh (in partnership with IRRI)

- efficient nitrogen fertilizer management in India and Mexico (in partnership with CIMMYT)
- a first approximation of the costs of national-level monitoring or verification needed to support a Nationally Appropriate Mitigation Action for the interventions above.

If successful, this activity will be repeated for other projects and sites in 2016.

Recommendation 5: CCAFS Theme 3 should continue work to develop methods to make inexpensive and accurate estimates of GHG emissions from landscapes that include smallholder farms.

The Standard Assessment of Mitigation Potential and Livelihoods in Smallholder Systems (SAMPLES) is a global research program initiated by CCAFS in 2011 that investigates the impact of smallholder agriculture on the climate and aims to generate robust and comparable data on greenhouse gas emissions and livelihood indicators for smallholder farming systems. See <http://www.samples.ccafs.cgiar.org>. SAMPLES research includes seeking methods appropriate for use in low income countries and reducing the costs of GHG estimates. In 2014, a workshop was held on low-cost approaches to GHG quantification:

<http://ccaafs.cgiar.org/workshop-reducing-costs-ghg-estimates-agriculture-inform-low-emissions-development>

During 2015 to 2018, GHG quantification and low cost methods will be developed for livestock in East Africa, Costa Rica and Colombia; rice in Bangladesh, Vietnam and Colombia, and fertilizer nitrous oxide emissions in Mexico and India. In addition, tools are being developed by the University of Aberdeen and IIASA to enable policy makers to estimate emissions from different mitigation options.

As outlined under Recommendation 2, Flagship 3’s vision is to follow the pathway outlined for improving estimates in our quantification syntheses (see Olander and Wollenberg, Environmental Review Letter special issue 2014), namely to conduct intense measurement campaigns that enable improved calibration of models that enable better estimates and identification of mitigation strategies. Data and models will be shared on global platforms. CCAFS is presently in communication with the GRA to link the SAMPLES and MAGGnet databases.

Recommendation 6: CCAFS Theme 3 should develop efficient sample selection systems and plot designs for measuring biomass carbon stock change in smallholder farming and agroforestry systems. This is a relatively small project.

This recommendation is partly addressed by SAMPLES guidelines for GHG measurement in smallholder systems. See following

- Biomass carbon stocks:
 - Page 4 of the aboveground biomass chapter (http://www.weebly.com/uploads/2/6/8/2/26823384/kuyah_etal_biomass.pdf) includes a section called “selecting plots” that provides guidelines for selecting a stratification method.
 - Pages 7-8 of the aboveground biomass chapter (http://www.weebly.com/uploads/2/6/8/2/26823384/kuyah_etal_biomass.pdf) include a section called “scaling to whole farms and landscapes” that provides calculation procedures for extrapolating plot measurements to larger scales

- Soil carbon stocks:
 - Page 5 of the protocol chapter draft on soil carbon, (http://www.samples.ccafs.cgiar.org/uploads/2/6/8/2/26823384/samples_guidelines_chapter_6.pdf), there is a section on “Sampling Design - Stratification of the project area” that specifies criteria for stratification at both the farm and landscape level. Appendix A on page 12 gives detailed instructions on calculating the number of plots required.
 - Section 6.3, “Quantification of soil carbon stock changes” describes how to detect changes in SOC over time.

The protocol doesn't specify a procedure for efficient estimation of soil carbon stocks at the farm and landscape scale. It assumes the reader will know how to do this, having stratified the area and taken representative samples. We will add this information to the website in 2015.

Recommendation 7: CCAFS Theme 3 should consistently implement its requirement that publications supported by CCAFS be open access. CCAFS should investigate procedures for working with partners to get open access to partner publications that are partially the result of CCAFS-funded work.

CCAFS policy, as per CGIAR policy requires open access publications, but recognizes that inevitably, some very high impact journals (Nature, Science) are not open access though and trade-offs will occur.. We have a list of recommended journals and their status regarding open access that we send to authors and partners. We will continue to remind authors and partners of the open-access policy. In the future we would like to include this in contracts.

Recommendation 8: CCAFS Theme 3 should request that CGIAR provide all its units, including CCAFS Theme 3, a work and budget planning and reporting system where work plan commitments can be directly compared to delivered work, activities may have durations longer than one year, deliverables may be due in year later than initial funding, and expansions of prior activities are clearly linked to those prior activities. The new tracking system was not reviewed and may have these capacities.

A beta version of a new CCAFS planning and reporting system is being tested in 2015 and all of these features have been incorporated into its structure. The new site may be found at <https://activities.ccafs.cgiar.org/ip/>.