

Monitoring & Evaluation for Research for Development - Building a Results-based Management System for Climate Smart Agriculture

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Abstract: Making farming systems more climate smart requires taking different disciplines, sectors and scales into account, at the same time as facilitating farming system innovation within the context of climate change. Here we present a research-for-development program's case of the evolution from a logframe approach to an outcome and results-based management oriented Monitoring, Evaluation and Learning (MEL) system. The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is designing an impact pathway-based MEL system that combines classic indicators of research quality with innovative process and outcome indicators of developmental change. CCAFS has developed a methodology for evaluating with stakeholders factors that enable or inhibit progress towards behavioral outcomes in study sites and regions. Impact pathways represent the program's best understanding of how engagement can bridge the gap between research outputs and outcomes in development. Strategies for enabling change include a strong emphasis on partnerships, social learning, gender and social inclusion, capacity building, communication, and MEL that focuses on progress towards outcomes. The importance is highlighted of working with next-users in the development of impact pathways and consistent engagement with partners and users of research outputs throughout the life of the program. Theory of change can be used to balance the drive to generate new knowledge in agricultural research with the priorities and urgency of the users and beneficiaries of research results. Research alone may not lead to impact, but it can generate knowledge that can be put into practice to generate development outcomes.

Keywords: impact pathway, innovation, theory of change, research for development, climate-smart agriculture.

Introduction

While global poverty has been reduced over the past 25 years, much remains to be done to reach the targets for 2030 as articulated in the Sustainable Development Goals (UN, 2015a). With an expected extra 2-3 billion people to feed over the next 40 years, this will require targeted efforts to achieve making 70% more food available on the plate to keep up with rapidly rising demand (WWAP, 2012). Climate change is already affecting agriculture in many developing countries, and the effects will become increasingly challenging in the future. Climate change impacts are increasing the vulnerabilities of populations that are already struggling with food insecurity and poverty, even in the relatively conservative scenario of a global 2-degree temperature rise (Thornton et al., 2014a).

Agricultural research for development (R4D) has played a significant role in reducing food insecurity over the last decades and will continue to play a critical role in addressing the above challenges (Raitzer 2008). But it has not realised its full potential: the world food system continues to face challenges of persistent food insecurity and rural poverty in many parts of the developing world (FAO 2014). Many studies have shown that 'scientifically proven' technologies alone are not the only key to get to impact (Hartman and Linn, 2008; Pachico and Fujisaka, 2004).

In this paper, we outline a R4D approach based on theory of change and impact pathway thinking for program implementation, monitoring, evaluation and learning (MEL). This was undertaken by the

CGIAR¹ Research Program on Climate Change, Agriculture and Food Security (CCAFS). We describe the CCAFS case, where a theory of change approach combined with impact pathways and learning were employed to build an outcome-focused RBM for R4D. We discuss the experience, focusing on program design and systems for planning and reporting. The paper concludes with lessons for required institutional change and for MEL practitioners, researchers and policy makers.

Background and Approach

CGIAR science is carried out by 15 research centres with 10,000 scientists working in 96 countries and a host of partners in national and regional research institutes, civil society organisations, academia, development organisations, and the private sector (CGIAR, 2015). Its work contributes to the global effort to tackle poverty, environmental degradation, hunger and major nutritional imbalances (Raitzer and Kelley, 2008).

The challenges of demonstrating wide-reaching impact through R4D are compounded by a rapidly growing human population, climate change and other complexities of our time. To address this challenge, CGIAR has broadened its portfolio of new initiatives for strategic research as part of a far-reaching reform process. A key part of the reorientation of the R4D portfolio was in the move from an output to an outcome focus. Success is now to be measured in terms of research's contribution to behavioral changes, manifested in changes in knowledge, attitudes, skills and practices of a wide set of non-research next users, including development practitioners, farmers and policy makers. In 2014, CCAFS was one of four programs tasked with developing a comprehensive results-based management approach for R4D. Accordingly, CCAFS developed an approach to implementing RBM, focusing on outcome delivery (Figure 1). The theory of change defines several activities, such as developing the impact pathways for thematic research and regional work, trialing RBM with a subset of projects, training key partners in building impact pathways, and analytical systems support. These led to tangible outputs such as facilitation guidelines (CCAFS, 2015a), a RBM MEL strategy (CCAFS, 2015b), and an online [platform](#). This involved engagement with key next-users such as program partners, with the idea that these outputs would both be useable and an incentive to overcome existing barriers in the system and as such would facilitate changes in current practices via proactively changing organisational norms. For example, project leaders were trained in designing their projects from a demand driven and outcome focused perspective. They needed to ensure that the research outputs would be enabling and incentives to support the practice changes that are required to achieve positive impact through their projects.

CCAFS started life using a logframe approach (LFA), but it became increasingly clear that the program's vision of contributing towards development outcomes increasingly required an approach that acknowledges the importance of stakeholder engagement and capacity development. While a wide range of MEL approaches and methodologies with an outcome focus exist, none provides a blue-print solution. To adapt these approaches to a new program, the right mix of elements needs to be selected, creating a conceptual framework in support of the program's specific theory of change and MEL requirements. Springer-Heinze et al. (2003) advocate a holistic approach to impact evaluation and program monitoring with quantitative and qualitative elements, based on an impact pathway that can accommodate different stakeholder views, allows for reflection, and emphasises institutional capacity. Mixed methods provide opportunities to address the respective shortcomings of any single method as applied in practice.

¹ CGIAR is a global partnership that unites organisations engaged in research for a food secure future.

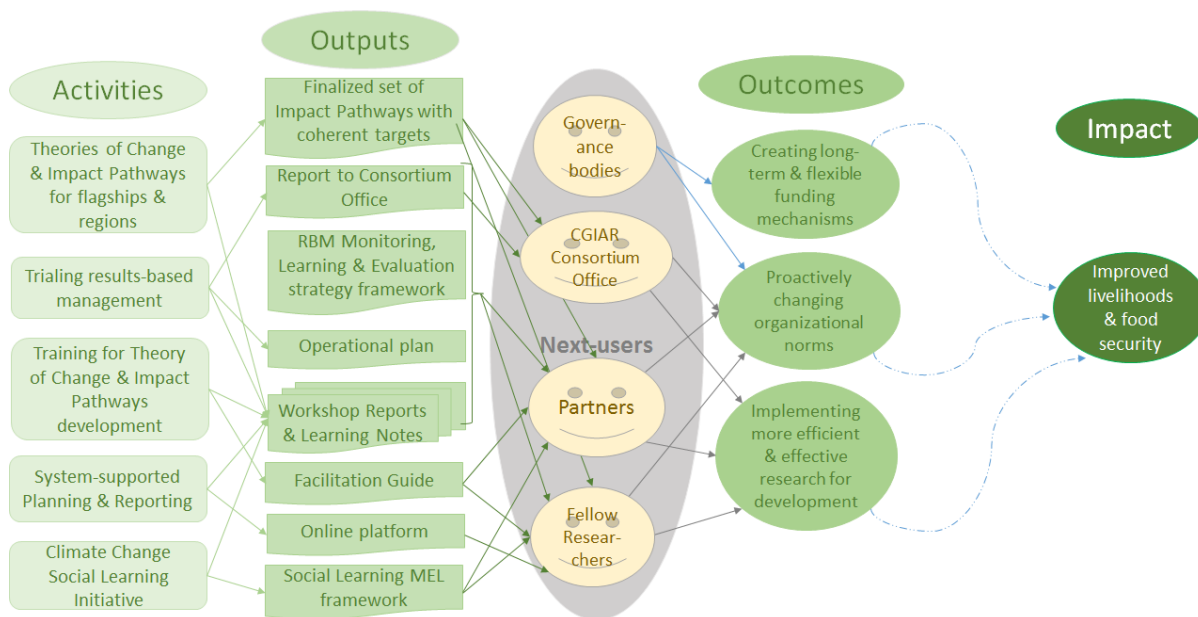


Figure 1: CCAFS' Theory of Change for its RBM approach and components

Findings and Analysis

Moving beyond the logframe approach

A logframe approach (LFA) has been widely used for project management; it adheres to a relatively rigid framework. It tends to prescribe a hierarchy of objectives converging on a single goal, a set of measurable and time-bound indicators of achievement, checkable sources of information, and assumptions of other impinging factors (Gaspar, 2000). In R4D, the assumption is that development agencies, communication units, ministry staff and other people who could use the findings are able to source the scientific evidence, understand it, know how to implement and apply it, and convey this to people who they think need them. While this has been a useful approach, it is debatable whether it is entirely suitable for ensuring the use of research results and their translation into outcomes (Crawford and Bryce, 2003). The LFA does not pay enough attention to involving key stakeholders and their networks to achieve impact, providing managers with information to learn and report to donors, and establishing a research framework to examine the change processes that projects seek to initiate (Douthwaite et al., 2008).

In line with donor requirements, CCAFS initiated its programmatic management approach on the basis of a logframe in 2009. Annual milestones were defined that were largely focused on producing scientific outputs and evidence of their achievement, which would then lead to developmental impact. CCAFS has gone through several iterations of the logframe that was employed for planning and reporting (CCAFS, 2015c). In 2010, a limited version was used (CCAFS, 2010) while more elements were added in the following years. Planning and reporting elements were predetermined to some extent by requirements from CGIAR, though for internal purposes additional elements were added in response to the limitations that were identified from year to year.

Trialing Results-based Management with Theories of Change in CCAFS

In 2013, CCAFS's portfolio expanded to include project work in two new target regions, and opportunities arose to implement and test a theory of change approach (Jost and Sebastian, 2014; Jost et al., 2014a). A new portfolio of six multiannual regional projects was set up and these were tasked with designing their projects using a theory of change approach within a results-based management trial (Schuetz et al., 2014a).

There is no single definition of a theory of change and no set methodology, as the approach assumes flexibility according to its respective user needs (Vogel, 2012). A theory of change provides a detailed narrative description of an impact pathway (a logical causal chain from input to impact, see Figure 2) and how changes are anticipated to happen, based on assumptions by people who participated in describing these trajectories. As such they provide an ex-ante impact assessment of a program's anticipated success. Theory of change is at its best when it combines logical thinking and critical reflection; it is both process and product (Vogel, 2012).

RBM builds on the same logical causal chain as the LFA but is more explicit about output-use. Within R4D output-use refers to strategies that directly engage the next-users in the research process, e.g. through stakeholder platforms and user-oriented communication products. At the turn of the century, many development agencies and donors, including USAID, IDRC, UNDP and the World Bank, reformed their performance management systems and M&E approaches towards a RBM approach (Binnendijk, 2000; Bester, 2012; Mayne 2007a and 2007b). These experiences with RBM have informed further development of the approach.

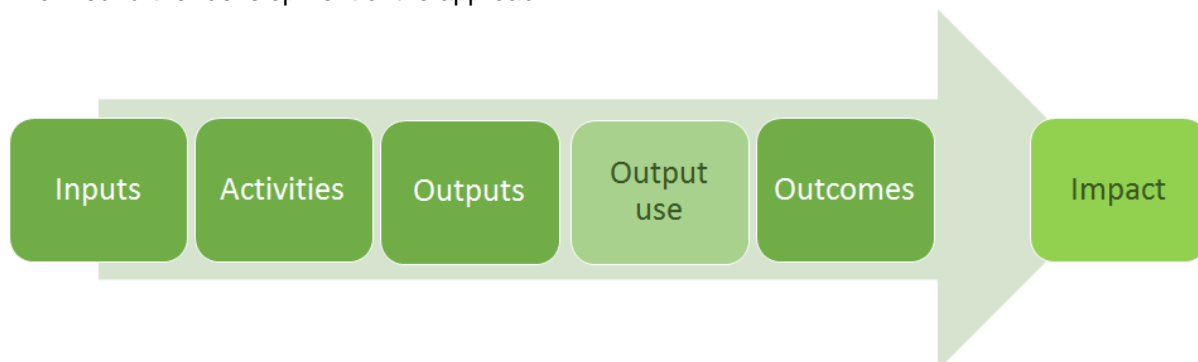


Figure 2: Theory of Change logical causal chain

To show that R4D contributes to the desired behavioral changes, i.e. outcomes, that enable long-term positive impacts is a particular challenge, as it requires more qualitative monitoring than dealing with quantitative means of measuring alone (Young and Mendizabal, 2009; Springer-Heinze et al., 2003). Evaluators generally agree that it is good practice to first formalise a project's theory of change, and then monitor and evaluate the project against this 'logic model' (e.g. Chen, 2005). The theory of change is a mental model made explicit by involving as many people as possible in its design. Key principles of the Participatory Impact Pathways Analysis method also include reflecting on these models, regularly validating the assumptions that were made, and adjusting program management accordingly (Douthwaite et al., 2013).

Within the CCAFS RBM, this theory of change approach to project planning helped position the R4D agendas further along the impact pathway (Schuetz et al., 2014a). Projects expanded their skill sets by bringing on board other partners that would help implement output-to-outcome strategies and thus

create more clearly defined causal logical chains (Figure 2; Schuetz et al., 2014b and 2014c). This is not to take over the work of development agencies, but it is to ensure that research findings are adequately contextualized to be a good fit for the demand and given purpose. The CCAFS RBM projects have thus challenged the common thinking that good science and publications are enough and by themselves will lead to impact - rather, they are necessary but not sufficient.

Building capacity and learning within the program for a Theory of Change approach

The RBM trial project teams were thrown in at the deep end. Used to a more traditional LFA, they were tasked with shifting to a theory of change and learning-based approach for planning their projects within the trial. It was quickly apparent that capacity to plan projects using this new approach had to be built within CCAFS and its partners.

Using theory of change approaches within R4D requires the strengthening of capacities of scientists to do research differently and work with non-research partners for impact, but also of institutions to facilitate such a shift. Several authors highlight the importance of building capacity for institutional learning (Hall et al., 2003; Horton and Mackay, 2003; Eade, 1997; Springer-Heinze et al., 2003). Johnson et al. (2003) show that participation of non-research stakeholders early on in the research process is important, as it can inform institutional learning in research organisations to change priorities and practices. It can also enhance the relevance of agricultural technologies and the capacity of these stakeholders to design their own action research processes (Johnson et al., 2003). Horton and Mackay (2003) outline the links between M&E, learning and institutional change and highlight the importance of institutional learning as a means to develop the capacities of the organisation and of individual researchers, and empowering non-research partners as key stakeholders in the process.

CCAFS worked with expert facilitators and trainers from Participatory Impact Pathways Analysis to implement a one-week training course on using theory of change for project and program planning (Alvarez et al. 2014). Initially about 20 participants were chosen strategically so that capacity would be available in CGIAR Centers at the point in time when CGIAR proposals would need to be developed following theory of change principles. In addition to project representatives, CCAFS science officers representing all themes and regions participated, to build in-house capacity. The training, in combination with theory of change facilitation guides (version 1: Jost et al., 2014b; version 2: Schuetz et al., 2014d) and learning notes (CCAFS, 2015a), helped highlight the opportunities (and constraints) of rolling out RBM to a whole R4D program. An online community of practice (and wikispace) was established and allowed for continued documentation and exchange of experiences.

CCAFS' Results-based Management Trial - Insights from researchers and partners

CCAFS' approach to RBM is centered on adaptive management, regular communications between program and projects, and facilitated learning within projects. Besides periodic virtual meetings, trial participants were surveyed for a more in-depth and standardised reflection, and for capturing lessons and achievements from their experience (Schuetz et al. 2014b and 2014c). These lessons and the programmatic perspective by the CCAFS Management Committee were documented in reports (Thornton et al., 2014b, CCAFS annual progress report) and a series of learning notes (CCAFS, 2015a). The approach to developing the impact pathways was simplified over time, mostly by reducing the number and type and number of indicators and level of complexity so that the wider group of people who were expected to work with them would continue to buy-in to the approach (Schuetz et al., 2014d). For example we focused on indicators at the outcome level and dropped any further development of detailed output progress indicators.

There are many people within CGIAR Centers and CCAFS partners who are willing to take on the challenge to develop new ways of collaborating and working beyond delivering outputs towards outcomes (Schuetz et al., 2014b). After one year of the trial, projects had made considerable progress. For example project leaders and teams became more reflective in their project planning and reporting, identifying opportunities to adapt to new insights, and questioning users, use and usefulness of research outputs to facilitate and encourage development outcomes. Another area where we saw some progress was the improvement of narrative qualitative descriptions of progress towards and achievements of outcomes. However, making fundamental shifts in the way of working takes time and (initially at least) additional resources. It requires iterative and continuous processes. Staffing, or the profile of project team members, and project team composition are emerging as key factors for success. Project staff has acknowledged that they may require additional skills beyond disciplinary expertise, such as skills in coordination, facilitation, engagement, communications, participatory and learning-oriented M&E. We are exploring how additional support can be provided in areas such as engaging with stakeholders and using RBM.

Rolling out Results-based Management for CCAFS as a whole

Opportunities for changing the programmatic approach to project planning, implementation and MEL emerged when CCAFS was approaching the end of its first phase in 2014. Theories of change were developed and defined for all four research and five regional programs in CCAFS as a first step in putting together the new program portfolio (Schuetz et al., 2014e). Figure 3 provides an illustration of one research theme's theory of change component with its regional elements, indicators and outcome

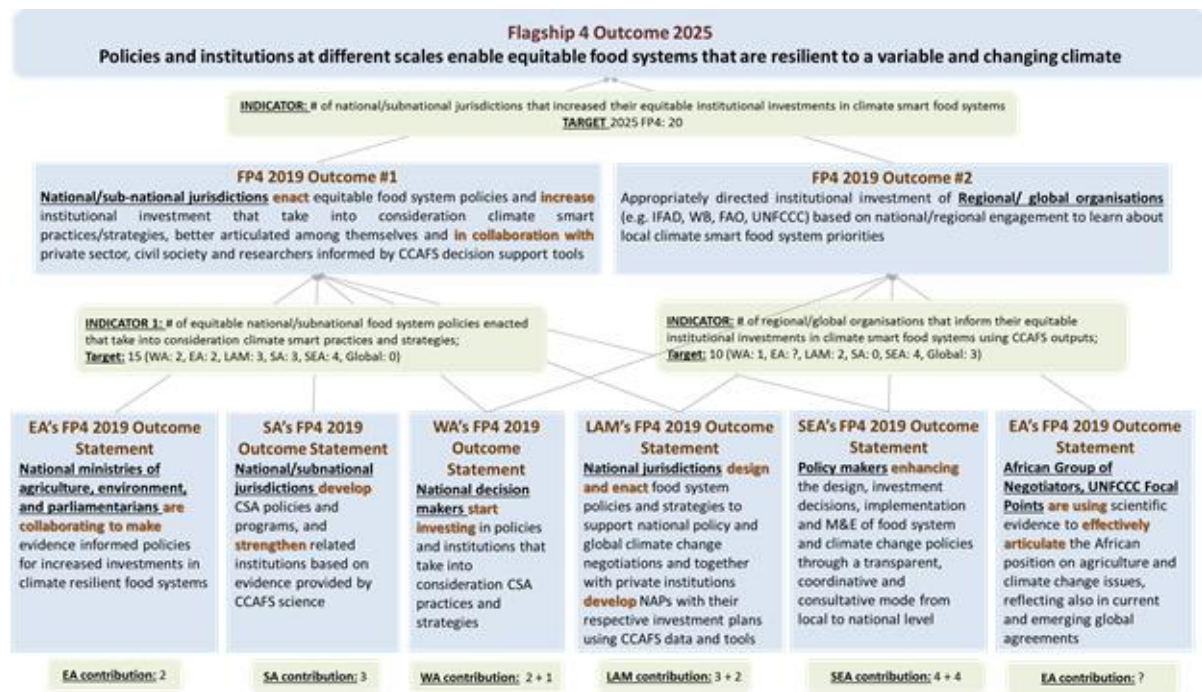


Figure 3: Illustration of a CCAFS thematic IP component (drawn from the Flagship Program on Policies and Institutions for Climate Resilient Food Systems)

While it took a considerable amount of effort, the iterative development of the CCAFS theory of change was done with a view to attempting to be as efficient as possible. At the start most interactions were virtually facilitated and built on previous engagement and regional priorities. For completion, key next-users and stakeholders participated in five regional face-to face meetings (Schuetz et al., 2014e and 2014f).

The theory of change development and facilitation process, and guidance documentation were revised to make them leaner, more contextualised and easier to implement (Schuetz et al. 2014d). The theory of change building process is one key component in the CCAFS MEL system that was developed to support the new approach in a comprehensive manner (CCAFS, 2015b).

Building on the above, a CCAFS Monitoring, Learning & Evaluation Strategy was developed (Schuetz et al. 2014g), with the overall goal to develop an “evaluative culture” within CCAFS that encourages self-reflection and self-examination, seeks evidence, takes time to learn, encourages experimentation and change so that MEL becomes an integrated mechanism. The strategy includes a conceptual framework, guided by overall programme principles for partnership, engagement and communications in a modular way, to best meet the demands of the programme as a whole, its projects, and the wider CGIAR system (Thornton et al., 2014c). For project implementation this led to some built-in and on-going monitoring and documentation of project activities on the outputs use, i.e. on engagement, partnerships and communication. Some elements are prescribed by CGIAR governance bodies, including the carrying out of baselines, independent impact assessments, and periodic external evaluations. Programmatic flexibility exists within the day-to-day operational MEL, as a system is required that allows enough flexibility and adaptability to be applied to the different types of projects and programs.

Implications for Policy, Practice and Research

Working with theories of change and impact pathways has major implications for MEL (Schuetz et al., 2015). It implies a move to contribution rather than attribution, i.e. to show our contribution we acknowledge the role and inputs of partners and other actors both in achieving outcomes and in providing evidence for those outcomes, lots of factors caused the change, rather than trying to claim a change solely to our intervention (AIDLEAP, 2015, [CCAFS glossary](#)). Building in [triple-loop learning](#)² helps enable people to distil key lessons from reflection (hindsight) and make best use of those lessons (insights) for future planning (foresight) and can make a major contribution to reflection and to supporting adaptive management, so that project teams can better deal with uncertainty. At the same time, not everything can be measured; this highlights the need for narratives that can complement and support more quantitative information.

As part of creating a programme-enabling environment, CCAFS embraced the three-thirds principle, whereby one third of effort is spent on engaging with partners to decide what needs to be done and how; one third on doing the actual research, often in partnership; and one third on sharing results in appropriate formats and strengthening capacity of next users to utilize the research to achieve outcomes and impact. This implies different budgeting and funding structures, so that appropriate levels of resources are allocated to capacity building, communications and engagement with the wide range of different partners likely to be needed (CCAFS, 2014). These elements need to be budgeted

² Triple loop learning is a series of learning steps, from receipt of information (single loop), to reflecting on what activities will be more effective (double loop), through to behaviour change as a result of that reflection by multiple stakeholders (triple loop) (Carlile et al. 2013).

for explicitly within a project life-cycle, rather than as an after-thought. At the same time, there is still much work to be done on how to monitor outcomes effectively, evaluate the real share of contribution towards the observed change, and assess value for money. Similarly, delivery of outcomes, especially at scale, may take time for research-for-development programs. Longer funding cycles could be expected to facilitate this considerably.

The CCAFS experience has highlighted several operational principles for RBM implementation. First, there is a need to focus on people and users, on utilizing M&E as a tool to help achieve outcomes, and on accountability - it is the people within organizations that make behavioral and practice changes happen. Second, there should be an emphasis on learning through M&E activities, i.e. an M&E system for R4D needs to integrate both monitoring and impact evaluation real time. Robust knowledge needs to be generated that can feed into developmental policy and investment decision making, and this in turn requires a cumulative and catholic approach to choice of impact assessment methods at different levels (Maredia, 2009). Third, adaptive management needs to be encouraged as a key element of RBM. As a tool that is based on learning processes, it can improve long-run management outcomes. The challenge in using it is to find the balance between gaining knowledge to improve management in the future and achieving the best short-term outcome based on current knowledge. Fourth, planning, reporting and evaluation procedures need to be as simple as possible while still providing (most of) the information needed for effective and timely programme management. In this the development and implementation of an online platform was an investment to support and guide programme participants in their contribution to the programme's results-based management system and developed their capacity at the same time.

Sharing findings along the way is a good way to foster the inclusive involvement of as wide a range of stakeholders as possible in project planning and implementation. Encouraging researchers to get early drafts of findings out to potential users for feedback from early on is one way to build a learning culture and to encourage open-mindedness. Lessons have come from surveys (e.g. with the trial project teams) and via collective reflections and evaluations (e.g. from the workshop series with participants and the programme management team).

Rigid application of just one specific approach most likely will not work. Whether it is the adoption of a technology, an M&E methodology, a learning approach or a scientific result, it is often not the whole package that is attractive to users but specific pieces. We need to allow users to cherry pick while ensuring that the relevant linkages remain intact so that the context is not lost for others who may want other cherries.

Solutions that are good enough rather than optimal. In many domains of knowledge and practice there is no best practice or option, particularly when the problem is complex and resources are constrained. CCAFS made considerable changes once it had started to implement an approach based on theory of change and impact pathways, and in time moved towards a leaner and simpler model. One of the key messages from the RBM trial process was the need for systems that cover most users' needs, rather than aiming for completeness that could add unwanted complexity.

Addressing tensions across scale. CCAFS is still in the process of embedding theories of change for the different organisational units of the program, to provide a flexible framework that allows for aggregation of output, outcomes and targets across the different units. For example, targets need to be framed locally with users and beneficiaries, and voiced in such a way as to allow the flexibility to deal with uncertainty and emerging priorities and opportunities. New investments of time and effort

may be needed to identify and work with non-traditional partners to promote behavioral change in shared IPs.

Providing value for money. Many members of the donor community now require that grantees demonstrate value for money. For instance, the Deutsche Gesellschaft für Zusammenarbeit states that its 'work is systematically geared towards results, the yardstick by which we measure the success of our work. We want to help achieve tangible positive changes on the ground' (GIZ, 2015). Some have critiqued the whole notion of payment by results as applied to development and research-for-development on the basis that it provides perverse incentives that actually diminishes cost-effectiveness (see Chambers, 2014). As noted above, there is much work still to do on appropriate measurement mechanisms, but this does not diminish the need to demonstrate accountability.

Balancing science and outcomes. Research is often curiosity-driven, and traditional indicators of success center on peer-reviewed publications in high-profile academic journals. In today's highly competitive research environment another crucial success factor relates to fundraising: the ability to write and win competitive research proposals. Neither of these motivations for research is guaranteed to deliver development outcomes. For CGIAR and its research programs, it is still early days, but preliminary results suggest that "successful RBM" relates to effective and efficient research leading to outcomes, with a minimum of perverse incentives (Thornton et al., 2015). The building of an impact pathway with a narrative theory of change forces researchers to give some thought to what lies between solid science, great technologies, and their positive developmental impact. A mix of an outcome-focused theory of change with people and partners at the core, and a RBM approach that allows us to monitor, reflect, evaluate, and learn, are key elements for a programmatic MEL strategy - coupled with great science.

Conclusions

Requests by donors for a move towards outcome-oriented research programs are having considerable impact on the way in which research is conceived, planned, implemented and evaluated. A key requirement for such work is flexibility - the flexibility to adjust so that the outcome orientation works as a support mechanism and enabler rather than a one-size-fits-all straitjacket without space for innovation, serendipity and creativity. Results-based management offers this kind of flexibility. The shift to a R4D approach based on theory of change is fostering massive change, much of it for the better, in our view. However, it also comes with considerable challenges. Defining the necessary changes, and developing new processes and mechanisms including monitoring and more built-in evaluation in real time, requires effort and resources, which are often grossly underestimated and inadequately planned for. Some of these challenges arise because of the nature of research: the results are not known from the start, unlike in engineering where the outcomes are generally much less uncertain. Another challenge is that CGIAR is a R4D and not a development organisation, and it is still striving to balance the need to do great science with the need for impact. We need to avoid the results-based focus being to the disadvantage of the science, and development being seen to be in competition with the science. Rather, they need to be seen as complementary, enabling, and liberating.

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