MILLENNIUM CHALLENGE CORPORATION
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Issue Brief

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MCC's First Impact Evaluations: Farmer Training Activities in Five Countries

Introduction and overview of results

The Millennium Challenge Corporation is releasing its first set of independent impact evaluations, which are designed to use rigorous statistical methods to measure changes in beneficiary income. These first five impact evaluations—for farmer training activities in Armenia, El Salvador, Ghana, Honduras, and Nicaragua—reflect a small portion of both MCC's investment and evaluation portfolios. These activities total less than 13 percent of the total budget in these five compacts, and 2 percent of MCC's global compact portfolio. However, they offer valuable lessons and a first look at how MCC uses evaluations for accountability, learning and for improving its work.

Independent evaluations are an important part of MCC's **evidence-based approach**. MCC uses evidence to guide decision-making on country selection, program design, appraisal, and implementation. Coupled with transparency and a culture of learning, this approach allows MCC to continuously improve its programs—in both current and future compacts—while also benefitting other U.S. agencies and the international development community.

MCC delivers results along a continuum from before investments begin to their completion and beyond. This comprehensive "**continuum of results**" begins with policy reforms associated with MCC compact eligibility and program investments. During compact implementation, the continuum measures different results: inputs and outputs (such

At a Glance

- Independent impact evaluations of farmer training activities in Armenia, El Salvador, Ghana, Honduras, and Nicaragua.
- Activities represent 13 percent of these five compacts and 2 percent of MCC's global portfolio.
- According to MCA monitoring data, MCC was very successful in meeting or exceeding its targets for these activities. The average completion rate of output and outcome targets specific to the activities covered by these evaluations is: Ghana (103 percent), Armenia (103 percent), Nicaragua (112 percent), El Salvador (131 percent), and Honduras (158 percent).
- Impact evaluations allow MCC to take a step further—to test how outcome achievements translate into farm income and ultimately household income.
- Three evaluations detect increases in farm income: El Salvador dairy (doubled farm income), Ghana northern region (increased crop income) and Nicaragua (15-30 percent increase in farm income).
- Increases in household income are not yet detected. This is raising interesting questions about how to achieve and measure changes in household income.
- MCC is using impact evaluation findings to test traditional assumptions about what works, learn lessons, adapt business practice, and improve effectiveness.

as farmers trained) and interim outcomes (such as farmers using improved techniques learned through training) as programs reach completion.

According to MCA monitoring data, we were **very successful in meeting or exceeding our output and outcome targets** for these activities. The average completion rate of output and outcome targets specific to the activities covered by these evaluations is: Ghana (103 percent), Armenia (103 percent), Nicaragua (112 percent), El Salvador (131 percent), and Honduras (158 percent). MCC is proud of these achievements, but because its mandate is to reduce poverty, MCC also tests whether and how these outcomes lead to changes in income—first farm income and ultimately household income for program participants. This is not an easy task and cannot be measured with monitoring data alone, so MCC uses independent impact evaluations to verify that output and outcome results measured by monitoring data are actually attributable to MCC's investments.

These five impact evaluations provide encouraging news about MCC program successes:

- ★ In El Salvador, the evaluators found that **dairy farmers doubled their farm incomes**.
- ★ In Ghana, northern region farmers' **annual crop income increased significantly** relative to the control group, over and above any impacts recorded in the other zones.
- ★ In Nicaragua, project participants' **farm incomes went up 15 percent to 30 percent** after two to three years of project support.

In fact, these evaluations show **increases in farm income in three out of the four countries** where methodologically sound evaluations were possible. While MCC was successful in meeting or exceeding its output and outcome targets and saw increases in farm incomes in these three countries, **none of the five evaluations were able to detect changes in household income**. This raises interesting questions about the "theories of change" embedded in the program logic for these and other farmer training programs, traditional assumptions of how program interventions lead to increased household income (as opposed to farm income) and the challenges associated with producing *and* measuring changes in household income.

MCC is applying lessons from these impact evaluations to improve the effectiveness of its future program investments and evaluation practice and has already found opportunities to apply lessons to its current portfolio with course corrections of ongoing programs and evaluations.

Impact evaluations

MCC commissions independent evaluations for all its major programs. Sixty percent of MCC's major activities undergo *performance* evaluations that look at the status of targeted beneficiaries before and after the intervention. The other 40 percent, including the five farmer training investments described here, undergo *impact* evaluations that use scientific methods to measure changes in income that are attributable to the MCC investment. These five impact evaluations are the first in a large pipeline of more than 100 evaluations—both performance and impact—that are underway for MCC investments. Impact evaluations are:

- ★ **Rigorous:** An impact evaluation is defined by the ability to estimate the counterfactual (what would have happened to the same group of individuals if they had not received MCC's assistance). The most rigorous method for estimating the counterfactual to measure attributable program impacts is through randomized control trials, but there are other scientific methods that can be used as well.

- ★ **Independent:** MCC uses teams of independent professional researchers to carry out its evaluations. These teams are selected through a competitive process and include experienced and respected specialists. MCC's use of independent professionals is intended to ensure that the evaluations represent an unbiased assessment of the activities being studied.
- ★ **Rare:** MCC is the clear leader among the donor community in the use of impact evaluations, which remains rare. For example, a World Bank study[1] identified only three impact evaluations using experimental designs in farmer training anywhere in the world over the past decade. MCC already has five, with more in process and scheduled.

While there are many tools to measure results and foster learning, there is no more rigorous tool than an impact evaluation that integrates judicious use of mixed evaluation methods to do the following:

- ★ **Test attribution:** Impact evaluations compare what happened with the MCC investment to what would have happened without it, through use of a counterfactual. This makes it possible to know whether the observed impacts were caused by an MCC investment or by external factors that affected everyone, like increased market prices for agricultural goods, national policy changes or favorable weather conditions.
- ★ **Test assumptions about what works:** Because impact evaluations can rigorously measure changes in income and attribute those changes to program interventions, they can be used to test traditional assumptions about how planned interventions are expected to lead to poverty reduction.
- ★ **Build evidence:** Impact evaluation findings inform future program design, so program planners can rely less on assumptions and more on evidence about what works.

Results from MCC's first five impact evaluations

MCC is committed to transparency and publishing findings from every impact evaluation, as well as each evaluation's methodology, primary data and formal peer review to allow the broader development community to learn from its experience.

These **five impact evaluations tell only a part of the story** in the MCC compacts in Armenia, El Salvador, Ghana, Honduras, and Nicaragua. Each of these five farmer training activities is one of many components of a larger compact, as well as one part of a larger integrated agriculture project that includes related components such as irrigation infrastructure, rural roads, land rights, or access to credit. MCC has forthcoming evaluations—both performance and impact—to measure results for the remaining compact components.

The impact evaluations found increases in farm income in several of MCC's farmer training investments. In El Salvador, the evaluators found that dairy farmers doubled their farm incomes. In Ghana, northern region farmers' annual crop income increased over the southern and central regions, though additional analysis is required to further understand the regional differences in impacts. And in Nicaragua, program participants' farm incomes went up 15 to 30 percent after two to three years of project support, though additional analysis is required to further understand these impacts.

1 IEG (Independent Evaluation Group). 2011. Impact Evaluations in Agriculture: An Assessment of the Evidence. Washington, DC: World Bank.

Other evaluations, however, including those in Armenia and southern and central Ghana, do not detect impacts on farm income. Still others—evaluations in Honduras and the horticulture component in El Salvador—were not able to effectively measure the impacts on income because appropriate treatment and control groups were not maintained. In the case of Honduras, the evaluator pursued an alternative evaluation approach because a counterfactual could not be established. The alternative approach estimated a statistically significant $600 impact on annual crop incomes of participants, but MCC does not believe that this estimate is credible enough to claim a positive impact. And although MCC met or exceeded its output and outcome targets, and evaluators found increases in farm income in El Salvador, Ghana and Nicaragua, the evaluators were not yet able to detect statistically significant increases in household incomes. This is raising interesting questions about how to achieve and measure changes in household income.

MCC's approach to development means a commitment to transparent results, even when we fall short of what we aimed to achieve. This is central to MCC's evidence-based model and commitment to accountability and learning.

Lessons from MCC's first five impact evaluations

The results of these first five impact evaluations offer substantial learning opportunities both for impact evaluations and agriculture practice areas. Some of the many lessons MCC and partner countries are learning are:

Test traditional assumptions about what works to increase incomes. The development community has been conducting farmer training activities for generations with the aim of reducing poverty through, for example, improved agricultural productivity, greater market access and improved crop prices.

★ **What we learned:** These evaluations suggest that some traditional methods may not necessarily work as expected. For example, four of the five evaluated activities used starter kits, a package of inputs like seeds, fertilizer and equipment, to complement farmer training. Starter kits are widely used, under the assumption that they create incentives and opportunities for farmers to adopt new techniques and change their behaviors in ways that will lead to increased income. The findings of these evaluations have caused us to question whether, in some cases, the starter kits worked as expected.

  Taken together, results from these five impact evaluations also suggest that we need to carefully consider duration, size and content of farmer training when designing for specific interventions to be sure they support assumptions about behavior change. For example, findings indicate that a longer period of mentoring seems to generate more sustained behavior change. The size of training programs also matters. The findings suggest that training fewer farmers more intensively leads to greater sustained behavior and increased farm income than training large numbers with a shorter duration. And finally, results indicate that implementing a standard curriculum for the sake of efficiency is not always effective—highlighting the importance of customized training and technical assistance within the context of specific farmer needs.

★ **What we are changing:** MCC is planning deeper analysis of the data sets from the first five evaluations to support greater learning on all these issues to inform current and future agriculture investments. MCC is keeping these lessons in mind as it reassesses the training approach and curriculum in the Burkina Faso and Moldova compacts, and will look for opportunities in its current compact portfolio to refine evaluation approaches to allow more learning about the circumstances under which starter kits work best.

Use program logic to inform evaluation design and to course correct during implementation. The program logic lays out the chain of events a given program is expected to generate that leads to increased household income. It is the starting point for both program design and evaluation planning. It maintains assumptions about how project components link together and what changes will occur over what time period.

- ★ **What we learned—sequencing:** When an infrastructure investment, such as irrigation, is directly linked to other activities (such as how a reliable source of water encourages trained farmers to shift to higher-value agriculture production), properly sequencing the rollout of the interventions is key. The case of Armenia provides a clear example of how breaks in the program logic can impact the ability to produce and measure results. While the program was designed to pair farmer training with improved access to irrigation, implementation delays meant that irrigation infrastructure was not complete until after the farmer training activity was concluded (with both the treatment and control groups receiving the training) and evaluated. This has made it impossible to measure the causal impact of water and training on farmer behavior.
- ★ **What we are changing:** Going forward, MCC will monitor the moving pieces carefully and be prepared, for example, to delay training to stay aligned with other components that may be delayed but are essential to the program logic. In the ongoing compact in Moldova, for example, training in the irrigation systems targeted for rehabilitation has been delayed in order to minimize the gap between training and completion of irrigation and allow for training and evaluation after water is flowing. The Burkina Faso farmer training and irrigation activities are also under review by MCC and MCA-Burkina Faso due to potential sequencing issues. As implementation delays impact sequencing, the timing of evaluation and data collection should also be reviewed and rescheduled as appropriate.
- ★ **What we learned—time horizons:** A key part of the program logic is the assumption about how long it will take for planned interventions to translate into increased incomes. The Ghana evaluation is an example of not allowing sufficient time to observe changes in adoption and other outcomes. While the original program logic assumed at least two crop cycles would be necessary to see changes in farmer behavior, implementation delays meant that evaluators were able to track adoption for only one crop cycle. This short period of observation could be one reason that the evaluation does not detect increases in income in two of the three program regions.
- ★ **What we are changing:** To provide for adequate time to observe changes in farmer behavior, MCC and MCAs are currently revisiting the timing of follow-up evaluation surveys in Burkina Faso, Mali, Moldova, Morocco, Mozambique, and Namibia.

Choose the evaluation methodology carefully and based on the program logic. The most rigorous method for measuring attributable project impacts, and for learning, is through the random assignment of participants in program interventions. Because random assignment identifies similar groups of individuals that will (treatment) and will not (control) be exposed to project interventions, evaluators can compare the groups to measure their impacts. However, there are cases when this is not feasible and/or there is strong political push back, and other methods must be explored. In some cases, the compromise solutions have created challenges for measuring impact and for learning.

- ★ **What we are learning:** For several of these first five evaluations, MCC requested evaluators to use random assignment when possible to maximize the potential for learning. In the face of resistance to the perception that some farmers would be left out of the program, evaluators employed a randomized rollout approach to sequence program participation in two phases. The first round of treatment farmers is compared to a control group of farmers that receive training at a later date. The key to this approach is

that there be enough time between the two phases to see behavior change and accrual of benefits for the first farmers *before* the second round of farmers is trained. Once the second group is trained, it can no longer be used as a control group. Given the compacts' five-year time frame and implementation schedules, activities with randomized rollout evaluations generally trained the control group one year or two years after the first treatment group.

- ★ MCC is learning that randomized rollout has significant limitations in farmer training programs because it often does not allow enough time for benefits to accrue for the first farmers before the comparison takes place. This risks underestimating the impact of project interventions because they are simply measured too soon, as may be the case in the Ghana evaluation. More importantly, once the control group is trained, it limits the ability for evaluators to go back later to gather additional data to further understand program impacts using rigorous analysis. Given that most agriculture projects have a gestational period of multiple years before the primary benefits can be observed, it is important to maintain control groups and flexibility for timing the final evaluations and surveys.
- ★ **What we are changing:** For any future evaluations, MCC will be cautious about the use of randomized rollout methods in general and especially for farmer training programs. Given MCC's five-year compact timeline and the risk of program delays reducing periods of observation between treatment and control groups, the randomized rollout evaluation approach is especially risky for measuring impact and for learning.

Align incentives for implementers and evaluators to work in lock step. Effective impact evaluations require close integration between implementers and evaluators, starting from the creation of the program logic and throughout implementation. Changes in program implementation can have significant effects on the evaluation methodology. While farmer training implementers need to maintain some flexibility to respond to changing program conditions, these should be discussed early and often with evaluators so changes do not undermine the ability to learn and measure impact.

- ★ **What we learned:** The evaluations for the horticulture project in El Salvador and the farmer training program in Honduras are examples of how a lack of incentives for implementers and evaluators to coordinate can lead to compromised evaluations. Failed partnerships and lack of effective communication on both sides in El Salvador and Honduras have limited our ability to measure impact. In El Salvador, the defined treatment group was minimally treated by the implementer. In Honduras, the implementers' continuous adaptation of program participant selection criteria meant the evaluator was not able to identify a comparison group to establish a credible counterfactual.
- ★ **What we are changing:** MCC is working to create incentives for both implementers and evaluators to coordinate closely during program planning and implementation, including through clear contract language and requirements.[2]

Recognize that household income change is difficult to measure generally and even more difficult in agriculture. MCC is distinguished from other development agencies by its use of independent impact evaluations to measure impacts on beneficiary household income. This is a challenging task.

- ★ **What we learned:** While all five activities met or exceeded their output and outcome targets, and several achieved increases in farm income, none of the evaluations was able to detect changes in household income. This could be for two reasons: one related to farmer behavior and one related to measurement. First, as farm incomes increase, households with multiple sources of income might choose to reallocate

2 See MCC's *Principles into Practice: Impact Evaluations of Agriculture Projects* (October 2012) for more discussion.

more time and resources to farming, thereby substituting out income from other sources. Second, household income is difficult to measure, particularly for households with multiple sources of income.

★ **What we are changing:** MCC is exploring alternative and improved approaches for measuring household income—such as per capita consumption—for ultimate impact and standardizing this measurement across evaluations.

Design evaluations for learning, not just accountability. Impact evaluations can be used both for accountability (to measure *whether* planned activities led to increases in income) and learning (*why* they did or did not achieve impact).

★ **What we learned:** These first set of evaluations and others designed in the same time period were designed to focus primarily on accountability— measuring overall effects on farm and household incomes. They were less focused on asking questions essential to learning about the effectiveness of varied activity components or understanding why programs may or may not have worked. While these evaluations still offer rich opportunities for learning, the learning is not as targeted as MCC would like on how to make activities work better.

★ **What we are changing:** MCC will design future evaluations to foster more learning and look for opportunities to increase the learning potential of its current evaluation portfolio. This includes:

* **Be selective in how and when you evaluate.** To make efficient use of time and financial resources, impact evaluations should be focused where the learning potential is greatest, where rigorous evaluation (with a counterfactual) is feasible and where there is significant commitment of the various stakeholders to the evaluation.

* **Engage sector experts and partner countries in setting a learning agenda.** This will lead to more useful learning to inform future programming and facilitate the buy-in that is essential for evaluation success.

MCC is publicly sharing lessons learned from this set of impact evaluations with partner countries, U.S. Government agencies and development stakeholders. For example, MCC is working closely with Feed the Future and contributing evaluation findings to the Food Security Learning Agenda, as well as participating in and sharing learning through global platforms. MCC will continue to work closely with MCA counterparts in current and future MCC compacts, including through the November 2012 MCC Agriculture College, to share lessons and look for opportunities to apply them to current MCC investments.

Conclusion

MCC is committed to funding the most promising approaches to development, so it uses an evidence-based, continuum of results framework to determine what is working and what is not. MCC's data-driven approach to evaluation is based on a continuous improvement model that seeks to "build, measure and adapt"—over and over again. MCC is applying the lessons learned from these early compact experiences to improve the effectiveness of both its program and evaluation investments. MCC's public release of these independent impact evaluations showcases its commitment to accountability, transparency and learning within the agency and in the broader development community.