

## CHAPTER 13

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# PROGRAM MONITORING AS A TOOL FOR MEASURING, COMMUNICATING, AND IMPROVING PROGRAM EFFECTIVENESS

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REBECCA GOLDSMITH AND ANNE PIZER

## INTRODUCTION

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THE Millennium Challenge Corporation (MCC) is committed to producing results and ensuring that the American people are getting a good return on their investment. MCC employs technically rigorous, systematic, and transparent methods of projecting, tracking, and evaluating the impacts of its programs.<sup>1</sup> In other words, achieving results means more than just building more schools or disbursing more money for road construction; it means improving child learning or reducing barriers to transporting goods. It means more effective aid.

MCC's Monitoring and Evaluation (M&E) links three phases of programs: (1) pre-investment analysis, (2) tracking and assessing program implementation, and (3) learning for future program design. Each phase is important to MCC's overarching principle of focusing on results. Pre-investment analysis aims to direct money to cost-effective projects. Implementation analysis, typically called monitoring, ensures that projects stay on track, holds implementers accountable for meeting certain results, and informs project adjustments. Analysis of longer-term results, typically called evaluation, fosters learning to improve programming in the future.

MCC's M&E is not unique in the methods used. Rather, our approach is distinct in how we link pre-investment analysis with monitoring or tracking implementation. In other words, our pre-investment analysis, which includes cost-benefit analysis (CBA), is linked to our monitoring indicators' baselines and targets. MCC connects these analyses directly: we use baseline and target values from the benefit and cost streams as our baseline and target values for our monitoring indicators. This connection anchors the CBA to targets that experts believe can be achieved, while ensuring that monitoring targets are ambitious enough to justify the cost of the project. In addition, MCC is unique in presenting these analyses and plans to the public. This chapter describes MCC's M&E approach during the pre-investment and implementation phases and then discusses challenges encountered during these phases.

## 1 PRE-INVESTMENT ANALYSIS AT MCC

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For every country program, MCC begins with an analysis of potential projects. This analysis comprises three phases: (1) defining the problem, (2) developing a theory of change, and (3) conducting a CBA.

### 1.1 Problem Definition

The first step is identifying the problem that a potential project will address. In MCC's case, this problem is related to unlocking economic growth and reducing poverty. The overarching problem is identified using a tool called a Constraints Analysis, which relies on country-specific data to prioritize the main constraints or challenges to economic growth in a particular country. Once the binding constraints are identified, MCC tries to understand the root causes of the constraints by asking "Why?" If the constraint is high transport prices, then we ask "Why are transport prices so high?" If it is because buses are old and maintenance is expensive, then we ask "Why is that?" We keep asking "why" until we arrive at the root causes of the problems. We typically do this with in-country stakeholders and experts in the field, but we do not stop there. We also look for country-specific data to verify the answers and provide evidence for the root causes.

#### Example: Problem Diagnosis for MCC's Compact in Moldova

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Using MCC's compact in Moldova as an example, the problem was determined to be low productivity in the agriculture sector. After digging deeper into the root causes of

low agricultural productivity through stakeholder consultations and country data, MCC came to understand that Moldovan producers were facing weaknesses in various aspects of the agriculture sector: unreliable water supply for irrigation, expensive financing, poor access to markets and technologies, and insufficient knowledge of irrigated agriculture practices.

## 1.2 Theory of Change

The second step is understanding how to address the problem. Based on the answers to our series of “why” questions, we develop a theory of change or program logic. The theory of change describes how the project’s specific investments will lead to changes in outcomes or results that address the identified problem. MCC strives to include the following elements in our theories of change:

**Problem:** What is the problem we are trying to address?

**Chain of Results:** What are the expected inputs, outputs, and outcomes (short-, medium-, long-term)?<sup>2</sup> How are they related? Are relationships based on evidence?

**Assumptions and Risks:** Do the causal connections rely on assumptions or pose particular risks?

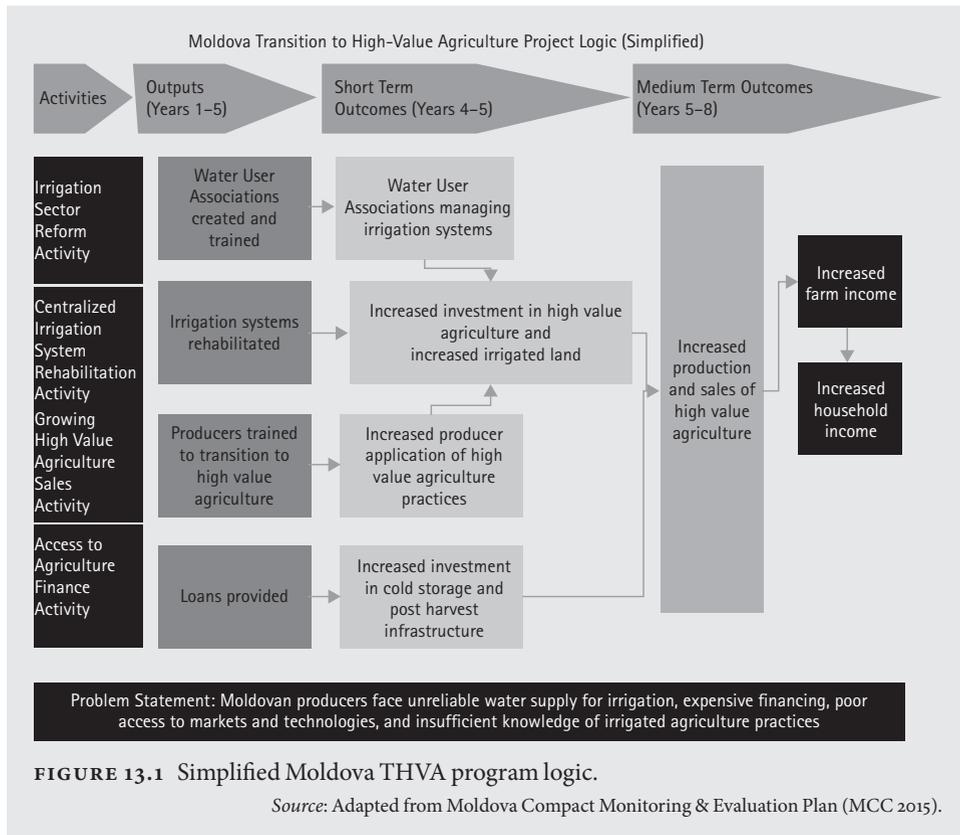
**Time Frame:** When is each result expected to be achieved?

### Example: Program Logic for MCC’s Compact in Moldova

Building on our example from the Moldova Compact, a very detailed theory of change was developed to reflect the interventions designed to address the root causes of low agricultural productivity. Figure 13.1 presents a simplified program logic for the Moldova Transition to High-Value Agriculture Project (THVA Project).

In the THVA Project, four activities were designed to work together to lead to more efficient water management, increased investment in high-value agriculture (HVA) on irrigated land, and greater availability of post-harvest infrastructure like cold storage. Production and sales of HVA were expected to increase and lead to increased farm and household income.

Key project assumptions were that training would be sufficient and financing would be available for producers to adopt new practices and shift crops, Water User Associations would be well-managed, and an increase in producers’ agricultural income would lead to an increase in household income.



### 1.3 Cost-Benefit Analysis

The third step is developing a CBA of the proposed interventions. Economists at MCC construct a model that compares the economic costs to the economic benefits of a project or policy. The costs include project and administrative expenses covered by MCC and others, as well as other costs, such as opportunity costs. The benefits often include increases in income or in firms' value added. The benefits usually include a subset of the outcomes included in the program logic. This is because not all of the projected benefits in the program logic can be quantified based on existing evidence. Sometimes certain outcomes are expected to occur, but there is insufficient literature to support valuing them quantitatively. In these cases, the expected outcomes are included in the program logic but not in the CBA, and the M&E Plan is designed to gather evidence on those outcomes. MCC calculates an economic rate of return (ERR) from the CBA. An ERR is a comparison of project costs to project benefits. Costs typically comprise MCC grant funding and contributions to project costs from others (such as local government or beneficiaries). Benefits are typically calculated as increases in income or savings in costs to beneficiaries due to the project. The ERR estimates the benefits minus the costs over a specified time period, usually ten to twenty years, depending on the project.

MCC prefers projects with high ERRs or high benefit-to-cost ratios. One of MCC's investment criteria is that projects must have a minimum ERR of 10 percent. The project-level ERR is compared to MCC's 10 percent hurdle rate. In this way, MCC screens out projects that are expected to have fewer benefits per dollar of cost.

### Example: Cost-Benefit Analysis for MCC's Compact in Moldova

For the Moldova THVA Project, MCC economists worked with agriculture experts and in-country support to quantify the main results identified in the program logic. This involved gathering information on the existing situation (baseline) and making projections about how the situation would change over time, including area of land irrigated, area of land cultivated with HVA (fruits and vegetables), maintenance of the irrigation system, value of production, and sales. Since the Moldova project included eleven irrigation systems, eleven different analyses were conducted and then summarized into one ERR for the project.

Consistent with the program logic, the economists projected that the fraction of land irrigated and cultivated with HVA would rise dramatically. At the same time, farm profit per hectare would increase from approximately US\$150–\$200 to more than US\$500–\$1,200 for grain crops (depending upon the size of farm and region of the country), and from approximately US\$300–\$450 to approximately US\$1,200–\$2,700 per hectare for fruit and vegetable crops. The increase in farm profits would cover the cost of irrigation, even in systems where irrigation costs would increase and under somewhat conservative profitability assumptions. All production costs, including farm household labor and capital investment costs, were included in the profitability figures. Figure 13.2 presents a simplified version of the original CBA conducted for the THVA Project.

Assumptions						
Avg profit per hectare before rehab	\$	180				
Avg profit per hectare after rehab (years 5 to 7)	\$	390				
Avg profit per hectare after rehab (years 7 to 20)	\$	1,540				
Decline of irrigation without project		2%				
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits						
<i>Without project</i>						
Total profit	\$ 198,000	\$ 198,000	\$ 194,040	\$ 190,159	\$ 186,358	\$ 182,629
Area irrigated in hectares	1,100	1,100	1,078	1,056	1,035	1,015
<i>With project</i>						
Total profit	\$ 198,000	\$ 198,000	\$ 194,040	\$ 190,159	\$ 889,200	\$ 1,349,400
Area irrigated in hectares	1,100	1,100	1,078	1,056	2,280	3,460
Area rehabilitated in hectares	0	0	0	0	6,200	15,500
<b>Total Benefit</b>	\$ -	\$ -	\$ -	\$ -	\$ 702,844	\$ 1,166,771
Costs						
Value of irrigation feasibility and design studies	\$ -	\$ 1,800,000	\$ 3,600,000	\$ -	\$ -	\$ -
Value of construction contracts	\$ -	\$ -	\$ -	\$ 16,200,000	\$ 26,900,000	\$ 10,800,000
Administration and farmer training	\$ -	\$ 1,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
<b>Total Costs</b>	\$ -	\$ 2,800,000	\$ 5,600,000	\$ 18,200,000	\$ 28,900,000	\$ 12,800,000
<b>Net Benefits</b>	\$ -	\$ (2,800,000)	\$ (5,600,000)	\$ (18,200,000)	\$ (28,197,156)	\$ (11,633,229)
ERR		14%				

FIGURE 13.2 Moldova THVA cost-benefit analysis.

Source: Moldova's Combined Centralized Irrigation System Rehabilitation Cost-Benefit Model (MCC n.d.b).

## 2 TRACKING AND ASSESSING PROGRAM IMPLEMENTATION

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After defining the problem, agreeing upon the program logic, and quantifying the benefits and costs, we begin to design the monitoring indicators for project implementation. We use the program logic as a guide for assessing whether or not the project is on track. Clearly defining the problem and agreeing upon the program logic are essential for building the M&E Plan. Similarly, developing the CBA enables us to set baseline and target levels.

For every country program, MCC tracks and assesses implementation by (1) selecting monitoring indicators, (2) setting baselines and targets, (3) identifying data sources, and (4) tracking progress and using monitoring data for analysis and decision making. MCC has a local in-country M&E team embedded in the program implementation unit that is responsible for conducting the monitoring.

### 2.1 Selecting Monitoring Indicators

Before implementation begins, we select indicators to be monitored at different levels of the program logic. Potential monitoring indicators are initially drafted alongside the development of the program logic and the CBA—before the program has even been approved and before the agreement is signed. Key indicators that will measure the accomplishment of the program's objectives are negotiated between MCC and the counterpart country and included in the legal agreement. Then more detailed indicators are fleshed out for the initial version of the M&E Plan with the implementing entity and other stakeholders. Initial M&E Plans are typically completed within three months of the start of implementation.

An MCC M&E Plan includes monitoring indicators for inputs, outputs, and short-term outcomes. We strive to identify an indicator for every output and outcome identified in the program logic. However, in some cases such an approach is not practical.

#### **Example: Benefit Streams for a Water and Sanitation Intervention**

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For a project that improves access to water and sanitation, the CBA could quantify multiple benefit streams, such as (1) the value of time saved by not having to walk and wait to retrieve water from a river, well, or community water post; and/or (2) savings associated with being healthier, quantified as more working days, and spending less money on doctor visits or medicine. The magnitude of these benefit streams will depend on the situation in the specific intervention area. For a rural water project, time savings might make up 75 percent of the benefits in the CBA, additional working days

20 percent, and reduced health expenditures 5 percent. In contrast, for an urban water project, time savings might be a much smaller portion of the benefits, but additional working days from being healthier might be much larger. The M&E Plan should take this into account and ensure that there are high-quality measures of time savings for the rural project and working days for the urban project, because those are the largest benefit streams in each case.

As noted previously, the outcomes in the program logic ideally should be based on evidence showing that they are plausible results from the intervention. If there is a lack of evidence for some element of the theory of change, we try to ensure that those linkages and outcomes are measured and do not fall into the bucket of “unmeasurable results” in our M&E Plan. This holds project designers accountable and fosters learning at MCC, as any outcome that is included in the logic without sufficient existing evidence will be measured and reported on as part of the M&E Plan. In addition, because the expected benefits from the project have been quantified in the CBA, we ensure that the largest benefit streams (which are also outcomes in the logic) are captured through indicators. It is essential that the largest benefit streams in the CBA are part of the M&E Plan, so that we know if the largest benefits materialize.

In addition to the specified results in the program logic, we include some indicators to track key assumptions laid out in the logic. If an assumption is critical to the theory of change, then it should be monitored regularly. If an assumption turns out to be wrong, the project may need to adapt to accomplish the desired results.

Over time, MCC has found distinguishing between “monitoring indicators” and “evaluation indicators” to be helpful.<sup>3</sup> Monitoring indicators measure results that we expect to occur during our implementation period, which for MCC programs is up to five years. Evaluation indicators cover results that are expected to materialize after the implementation period and/or that require sample-based surveys for measurement. For example, many MCC programs include large infrastructure investments that are completed right at the end of the five years. In those cases, the monitoring indicators are generally input indicators and output indicators, while outcomes are generally measured as part of the evaluation and not through the monitoring plan. This is because any behavior change or use of the new infrastructure is likely to take place after the five-year implementation period ends. However, monitoring plans for other types of projects, such as training programs where behavior change is expected in a shorter time frame, may include some short-term outcome indicators. Timing frequently prevents MCC from including high-level outcomes in its monitoring plans. In addition, when we start reporting on outcomes, other factors besides the MCC intervention can affect the measured results. Because MCC believes in understanding causal effects, we prefer to analyze outcomes when we have a model of the counterfactual to compare them to. This is ideally accomplished through an impact evaluation, or if an impact evaluation is not feasible, then at least through an evaluation where more analysis and explanation can be provided than a typical monitoring report.

When MCC selects indicators, five main criteria are taken into account, as required by the MCC Policy for Monitoring and Evaluation (MCC 2017):

**Direct:** An indicator should measure as closely as possible the result it is intended to measure.

**Unambiguous:** The definition of the indicators should be operationally precise and there should be no ambiguity about what is being measured or how to interpret the results.

**Adequate:** Taken as a group, indicators should sufficiently measure the result in question. Developers of the M&E Plan should strive for the minimum number of indicators sufficient to measure the result.

**Practical:** Data for an indicator should be realistically obtainable in a timely way and at a reasonable cost.

**Useful:** Indicators selected for inclusion in the M&E Plan must be useful for MCC management and oversight of the program. Developers of the M&E Plan should ask themselves who is the audience for each indicator and what actions would be taken based on the reported information.

#### MCC's Common Indicators for Agriculture and Irrigation

- (AI-1) Value of signed irrigation feasibility and design contracts
- (AI-2) Percent disbursed of irrigation feasibility and design contracts
- (AI-3) Value of signed irrigation construction contracts
- (AI-4) Percent disbursed of irrigation construction contracts
- (AI-5) Temporary employment generated in irrigation
- (AI-6) Farmers trained
- (AI-7) Enterprises assisted
- (AI-8) Hectares under improved irrigation
- (AI-9) Loan borrowers
- (AI-10) Value of agricultural and rural loans
- (AI-11) Farmers who have applied improved practices as a result of training
- (AI-12) Hectares under improved practices as a result of training
- (AI-13) Enterprises that have applied improved techniques

In addition to the above criteria, MCC has found that having common indicators, which can generally be aggregated across countries, is useful for reporting externally on sectors as a whole.<sup>4</sup> Common indicators are selected to be included into an M&E Plan *when it makes sense* based on the program logic. They are not required to be included if they do not measure the intended outcomes from the program logic. Over time, we have learned that common indicators that are aggregated should be kept to a minimum and should focus on the earlier parts of the program logic—the outputs and, for some sectors, short-term outcomes. Outcome measures can be harder to aggregate into a meaningful number; however, some are included as common indicators in order to standardize indicator definitions across countries. Even if they can't be aggregated, analyzing them as a group is helpful for understanding what has been achieved

within a sector. We have also found it useful to assign codes to the indicators to ensure that they can be identified easily through a management information system.

## 2.2 Setting Baselines and Targets

Most monitoring indicators have baseline and target values. The baseline is important to ensure that we understand the situation before the project starts. Targets are necessary to know if the project is proceeding as planned. MCC's approach to setting baselines and targets is unique because we pull baseline and target values from the benefit streams in the CBA to the extent possible. This approach works only for the indicators that are part of the benefits quantified in the CBA. But if the problem diagnostic, program logic, CBA, and selected indicators are well-aligned, this approach offers a powerful way of holding ourselves accountable. We use the projected outputs and changes in outcomes from the CBA, which were used to justify the project, as the targets for our monitoring plan. In addition, we use the projected time frame from the CBA (which should match the timeframe in the program logic) to set the year in which targets are expected.

Of course, if it was not possible to quantify all of the expected outcomes from the program logic in the CBA, there may be other indicators for which we cannot set baselines and targets from the CBA. In those cases, we use whatever data exist for baselines or we leave the baseline as "To Be Determined (TBD)" and then put funds aside to collect the necessary data ourselves. Similarly, targets are set using whatever evidence exists, including, at times, expert opinion. Some indicators are monitored without targets. An example is collecting data on temporary employment during construction projects. These data may be useful to collect and report for external reasons, but since meeting any particular target is not central to the results of the project, we would not establish a target. We try to keep these "informational indicators" to a minimum and focus the monitoring on key outcomes in the logic and CBA.

### Example: Monitoring Plan for MCC's Compact in Moldova

Continuing with the example of the THVA Project, we can demonstrate how the program logic and CBA were used to develop the monitoring strategy. Refer back to figure 13.2 with the simplified CBA for the THVA Project. Year 0 became the baseline and the projections for each year became the targets for those years. In figure 13.3, we show how we supplemented the indicators that measure benefit streams in the CBA with additional indicators that measure key results in the program logic. Specifically, this project will train farmers to use the irrigation system, but the number of farmers trained was not an explicit part of the CBA model, which was based on increased profits of land. However, training of farmers is an indicator that is worth tracking over time to check if the project is on track. Farmers being trained and transitioning their land to irrigated HVA are key pieces of the success of the project.

Indicator	Indicator Type	Baseline	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
Irrigated land (hectares)	Outcome (Level)	1,100	n/a	n/a	n/a	2,280	3,460
Farmers using improved practices (number)	Outcome (Incremental)	0	330	220	790	710	750
Farmers trained (number)	Output (Incremental)	0	500	350	490	1,810	1,150
Loans provided (\$)	Output (Incremental)	0	1.5 million	2 million	1 million	5 million	5.4 million
Water user associations created(number)	Output (Incremental)	0	0	11	0	0	0
Value of feasibility and design contracts disbursed (\$)	Input (Incremental)	0	1.8 million	3.6 million	0	0	0
Value of construction contracts disbursed (\$)	Input (Incremental)	0	0	0	16.2 million	26.9 million	10.8 million

**FIGURE 13.3** Simplified monitoring plan for the Moldova THVA Project.

*Source:* Adapted from the Moldova Compact Monitoring & Evaluation Plan (MCC 2015).

*Note:* Cells highlighted above indicate that these numbers come directly from figure 2: Simplified Original Moldova THVA Cost-Benefit Analysis.

In addition, we added some output indicators to ensure that complementary activities were proceeding as planned. For the THVA Project, creating water user associations was a required step before construction could begin, so it was essential to track whether or not this process was occurring on time. Loans were being provided for post-harvest support so farmers would have cold storage and links to markets, so we also added specific indicators for those pieces of the logic as well.

Finally, we moved the assessment of farm income (and household income) to an impact evaluation and did not include it in the monitoring plan. This is because so many factors influence farm income that it would be challenging to know if changes in farm income were due to our project. We would not want to base any adjustments to project implementation on an indicator that can be influenced by factors unrelated to the project. However, the estimated values for changes in farm income from the CBA were used to develop the evaluation plan, especially for designing surveys and establishing sample sizes.

In this example, we have included some outcomes as monitoring indicators. Both “Farmers using new practices” and “Irrigated land” are outcomes—the project is not paying directly for these results, and they can be influenced by other factors. However, we believe that these short-term outcomes are closely linked to the project interventions and therefore monitoring them is useful because they will provide an indication of whether the project is on track to realize the medium-term outcomes.

## 2.3 Identifying Data Sources

For each indicator, MCC stipulates a data source. Typically, data sources fall within two broad categories: administrative data or survey data. In addition, MCC is exploring

ways of collecting data with technological advances that are becoming more common and cost-effective.

**Administrative data.** Implementers or government ministries routinely collect administrative data on the inputs and outputs of their programs, such as money spent, number of people trained, number of kilometers of roads paved, children treated by health professionals, or students enrolled in schools, among others. Administrative data are usually collected continuously on all participants in a program. Because the data are already being collected, using this type of data is efficient and relatively easy.

**Survey data.** In contrast, many outcome indicators in the monitoring plan are not routinely collected by implementers and/or government institutions. In these cases, surveying participants or key stakeholders is necessary. MCC would collect primary data through household, farm, or business surveys or knowledge, attitude, and practice surveys. The type of survey depends on the indicator. For example, data on health expenses would come from a household survey, while data on costs of production would come from a business or farm survey. However, as MCC has increased its portfolio of projects working in policy and institutional reform, we have focused more on supporting the ability of government ministries or utilities to collect relevant outcome data and to analyze and use the data for their purposes, as well as for monitoring the project.

**Technological advances.** New ways to track changes in indicators are emerging. Phones, remote meters and sensors, and satellite/geospatial data are becoming more ubiquitous and affordable. MCC is piloting some of these data sources, mostly in electricity, water, and agricultural programs. For example, plug-in sensors can measure the frequency of power outages in countries. MCC is comparing the data from these sensors with the data from power utilities to assess which is the more accurate, cost-effective way to collect data on outages.

### Example: Data Sources for MCC's Compact in Moldova

For the Moldova THVA Project, each indicator has a data source based on project implementation plans, which specify data that will be tracked by implementers and data that will need to be collected. For the input and output indicators, data come from implementers' databases and records. Some outcome indicators can come from administrative data, while others require surveys because there is no existing data source. In Moldova, the water user associations keep administrative records of water pumped, land irrigated, fees collected, and expenses paid, which can be gathered from the associations on a regular basis for little cost. However, measures of farmer behavior and whether farmers are using improved practices come from a survey funded by MCC.

The Moldova project ended before the methodology to use satellite imagery to track agricultural production had been developed; however, more recent MCC irrigation projects are exploring using satellite imagery as a data source for monitoring land cultivation.

Indicator	Data Source
Irrigated land (hectares)	Water User Association records
Farmers using improved practices (number)	Farmer Survey
Farmers trained (number)	Training database of the implementer
Loans provided (\$)	Database of the financial institution
Water user associations created	Legal incorporation documents from each Water User Association; administrative records of the Government of Moldova
Value of feasibility and design contracts disbursed (\$)	Financial database of the implementer
Value of construction contracts disbursed (\$)	Financial database of the implementer

**FIGURE 13.4** Data sources for the monitoring plan for the Moldova THVA Project.

*Source:* Moldova Compact Monitoring & Evaluation Plan (MCC 2015).

## 2.4 Tracking Progress and Using Monitoring Data for Analysis and Decision Making

Now that we have identified our indicators and data sources, we are ready to receive progress reports and create products that allow us, decision-makers, and the public to understand the progress of our program and make adjustments as needed.

### Checking Data Quality

Ensuring high-quality monitoring data is one of the most challenging aspects of M&E. MCC has found these tasks to be helpful for increasing quality of monitoring data:

- Make indicator definitions clear and simple.
- Hire independent data quality reviewers in project design or early on in implementation to review data sources and identify weaknesses.
- Budget for increasing capacity of data systems, if possible.
- Require that inputs for indicator calculations be reported along with calculated indicator values.
- Request source data and obtain copies of the reports the data come from, along with specific page numbers, so that data can be double-checked.
- Check that indicator values are reported with the correct units, that calculations are correct, and that trends over time make sense.
- Require review of monitoring reports by sector experts—not just M&E staff.
- Present data to different audiences. Sometimes quality issues aren't identified until the data are used.

Monitoring reports must contain space for reporting on indicator progress and safeguards so that one cannot change data from previous reporting periods unless an error has been made. MCC has developed Indicator Tracking Tables (ITTs) for this purpose. Every quarter, the program's in-country M&E staff populate the ITT with data from the designated data sources and submit the ITT to MCC through a management information system. Currently, MCC does not require a narrative description of the ITT; however, some countries supplement the ITT with written explanations or graphical representations of the indicator results. We have found that a narrative description of every indicator value is not necessary, but some explanation of major deviations from expectations is important. So if an indicator falls short or exceeds its target value by 10 percent, a written explanation of "why" is included in the ITT. In addition, graphing the monitoring data can help to tell a picture that isolated data points might not tell. Simple, creative data visualizations are powerful tools we use to communicate the story that the monitoring data is telling. They can often highlight inconsistencies or identify data quality problems as well.

The ITT data are used by both implementers and MCC's headquarters for decision-making. The types of decisions that are influenced by monitoring data include resource reallocations, assessing targeting/recruitment strategies, implementation timeline adjustments, and project design changes (re-scoping/adding/canceling components). Over the years, MCC has found that it is essential to establish regular meetings to review the monitoring data; otherwise, the data may not be used.

All performance data used in MCC reports come from the ITT. MCC creates different reports that address different needs of the organization, including accountability to Congress and the American public, transparency of program progress, learning and improvement, and public relations. As part of our commitment to transparency and learning, MCC publishes different reports on its website using the monitoring data, including Key Performance Indicator Reports, Common Indicator Reports (for agriculture and irrigation, education, energy, land and property rights, roads and transport infrastructure, and water and sanitation), and Annual Reports.

Moreover, monitoring data are an integral input for evaluations of programs. A good evaluation must document the program being evaluated, and data reported against a well-designed monitoring plan describe what was actually implemented.

Finally, monitoring data is fed back into the CBAs. MCC calculates close-out CBAs after a program ends which includes updates to the cost-side of the CBA with actual costs. At that time, very little information on outcomes is available, but the benefit-side of the CBA can be updated with monitoring data, too. We know exactly how many people were trained or kilometers of road paved and those outputs are an important driver of the benefits in the CBA.

### Example: Reporting Monitoring Data on MCC's Compact in Moldova

The ITT was used throughout the implementation of the THVA Project in Moldova. The ITT in figure 13.5 shows that the project is at the end of Year 3. All of the water user associations have been created and loans for post-harvest infrastructure have been provided as planned. Training of farmers is ahead of schedule, but farmers are adopting

Moldova Indicator Tracking Table (simplified)					
			Year 3 October 2012 to September 2013		
Indicator	Indicator Type	Baseline	Actual	Target	Percent Complete
Irrigated land (hectares)	Outcome (Level)	1,100	n/a	n/a	n/a
Farmers using improved practices (number)	Outcome (Cumulative)	0	936	1,340	70%
Farmers trained (number)	Output (Cumulative)	0	3,669	1,340	274%
Loans provided (\$)	Output (Cumulative)	0	4.4 million	4.5 million	99%
Water user associations created (number)	Output (Cumulative)	0	11	11	100%
Value of feasibility and design contracts disbursed (\$)	Input (Cumulative)	0	3.7 million	3.6million <sup>1</sup>	104%
Value of construction contracts disbursed (\$)	Input (Cumulative)	0	1.2 million	16.2 million	8%

**FIGURE 13.5** Moldova Year 3 Simplified Indicator Tracking Table.

Source: Moldova Compact Indicator Tracking Table (MCC 2015).

Note: Many of these indicators changed from “incremental” in figure 13.4 to “cumulative” in this figure.

This was a change in MCC’s practices that happened during the implementation of the Moldova program. MCC decided to categorize all indicators as “Level,” “Cumulative,” or “Date”—See MCC’s Policy on Monitoring and Evaluation for definitions of these terms (MCC 2017). It was too confusing having some indicators reported on incrementally and some reported on cumulatively. So rather than reporting 313 farmers trained in Year 1, an additional 1,784 in Year 2, and an additional 1,572 in Year 3, the ITT includes a cumulative total.

<sup>1</sup>The original target for this indicator was \$5.4 million; however, the target was revised downwards once it was determined that the studies could be done for less.

improved practices at a slower rate than expected. In addition, the irrigation infrastructure construction is behind schedule.

This information was used to manage the project. Because the irrigation construction was delayed, MCC worked with the implementer of the farmer training component to delay training of the farmers in the irrigation areas until the last year of the project—right before the irrigation systems would be completed.<sup>5</sup> This maintained the fidelity of the program logic, so farmers were not trained on irrigation methods years before they actually had access to irrigation water.

### 3 ADDRESSING CHALLENGES

In MCC’s framework, challenges arise at each step in the process. The team may not agree on the theory of change, important indicators may be hard to track, and projects evolve. MCC has encountered all of these issues and more. This section discusses the most common challenges that have arisen and how these challenges have been tackled.

### 3.1 Agreement on Theory of Change

When the team develops the theory of change, stakeholders must agree on the project inputs or activities and the results of those activities. For the CBA, results of the projects must be outcomes that can be quantified monetarily. This focus on quantifiable results can create tension because increasing income and decreasing costs are not outcomes that project implementers can control. In addition, implementers and sector experts tend to focus on the outputs of their projects, like building more schools. Therefore MCC's logic diagrams, CBAs, and M&E Plans have tended to include consistent, agreed-upon inputs, activities, and outputs, while outcomes, objectives, and even intended beneficiaries have been debated and inconsistencies have arisen between documents and team members' understanding. For example, a lesson learned from a recent evaluation of MCC's program in Jordan was to "ensure the compact objectives, logic diagrams, economic models and other communications about what the compact intends to do all align."<sup>6</sup>

As MCC has evolved, developing and agreeing on the theory of change has become a team product and not just a product of the M&E division. The theory of change is reviewed and updated during implementation when program changes or new information necessitate a revision. MCC has also developed guidance for staff to work closely together when developing CBAs so that the data and assumptions included are clear to everyone on the team and align with the theory of change.

### 3.2 Challenging Indicators

The theory of change may include concepts that are hard to quantify or measure. In these cases, the outcomes need to be defined clearly and objectively. For example, the Philippines' Kalahi CIDSS Community Driven Development Project aimed to empower communities to participate fully in development activities. Community empowerment can be measured in many ways. The project chose to track how closely community priorities, stated before the project, matched community projects that were constructed. For example, a match would occur if households said that they needed access to potable water and their community got a water project. The team converted the difficult-to-measure concept of community empowerment into an objective measure of how closely the final community projects matched households' self-identified needs.

If difficult-to-measure concepts cannot be defined clearly and data cannot be collected efficiently, MCC M&E may decide not to track these results. The cost of collecting and analyzing the data would outweigh the value of the data. For example, students need to attend school for our education programs to realize their impacts. As an indicator, student attendance is complicated and would involve collecting and analyzing daily attendance records for thousands of students. Instead, MCC has used school enrollment as a proxy for attendance.

### 3.3 Evolving Projects

MCC has encountered programs that significantly change over time. Monitoring plans should reflect the current program being implemented, and may therefore significantly

change over time as well. However, monitoring plans should not be modified solely for delays in implementation or failure to meet targets. When the program undergoes substantial change, monitoring plans are modified to reflect changes in the program's design or to incorporate course corrections or lessons learned. Modifications to the monitoring plan may include adding indicators, retiring indicators, modifying attributes of an indicator, or modifying baselines and targets.

MCC performs additional analysis before agreeing to changes in targets. For indicators linked to the CBA, the changes will be analyzed to assess whether the changes maintain the integrity of the original CBA. For example, if a target is lowered, does the project still pass MCC's required cost-benefit ratio? Typical reasons to adjust targets include updated baseline values, changes to the project scope, occurrence of exogenous factors, and corrections to erroneous data.

#### Example: Changing the Monitoring Plan for MCC's Compact in Moldova

The Moldova M&E Plan was modified five times during implementation, which is about average for MCC. The plan was updated when new information became available and as MCC updated its M&E requirements and best practices. The theory of change was reviewed and underwent a major revision in the middle of the program to ensure stakeholders had a common understanding of the logic. The plan became more detailed over time as indicators were added and data sources were changed. All major modifications were documented in an annex to the plan, which is available to the public. No significant targets were adjusted, even though some targets were not met because of issues with the irrigation feasibility studies. There was pressure to lower targets because of delays, but those requests could not be fulfilled as a result of the requirements in MCC's M&E Policy for target changes. Maintaining the targets made it very easy to see how the project performed compared with the original expectations.

## 4 CONCLUSION

MCC's monitoring approach includes rigorous pre-investment analysis on which the monitoring plans are developed. Indicators along with baselines and targets are based on the program logic and CBA, data are collected and reviewed at regular intervals to ensure the project is on track to meet its objectives, and indicators are adjusted based on new information or changes in project design. Although MCC has refined and improved its monitoring approach over the years, MCC has not changed its core practice of linking monitoring and evaluation indicators, targets, and baselines to the CBA. This framework ensures that MCC targets funds toward high-impact projects and then assesses whether these high-impact projects are on track. The last step in MCC's M&E framework entails using the M&E results to inform future projects. Concretely, the M&E results are shared publicly for others' learning and for MCC's use in future CBAs.

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## NOTES

1. See “Focus on Results” bullet (MCC, n.d.a).
2. Inputs are typically the human and monetary resources invested. Outputs are the goods and services realized with the inputs, and outcomes are the effects of the outputs.
3. Simplified definitions from MCC’s M&E Policy:
  - Monitoring indicators:** These indicators will focus on providing timely data during compact implementation that can inform programmatic decisions. The data that are reported by these indicators should be easily interpreted and should not be based on sampling.
  - Evaluation indicators:** These indicators will focus on assessing the achievement of high-level results. Any indicators for which progress will not be measurable during the compact implementation period and/or that require sample-based surveys for measurement will fall under the Evaluation category.
4. See MCC “Guidance on Common Indicators” and examples of common indicator reports (MCC, n.d.c).
5. The farmers trained in the first three years of the project were outside of MCC’s irrigation areas.
6. See Social Impact 2020.

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