# Armenia Monitoring & Evaluation Plan

Version 4
April 2010

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# 1. Overview

On March 27, 2006, The United States of America, acting through the Millennium Challenge Corporation (MCC), and the Government of the Republic of Armenia signed a Compact. Annex III of the Compact provided a description of the Monitoring and Evaluation (M&E) Plan for the MCA Program.

Monitoring and Evaluation (M&E) is essential for a results-based approach to program management. It was a key component of program design and remains incorporated into all facets of the program cycle through program close-out.

The M&E Plan serves the following functions:

- Explains in detail how the MCC and MCA-Armenia will monitor the various Projects to determine whether they are achieving their intended results and measure their larger impacts over time through evaluations.

- Outlines any M&E requirements that MCA-Armenia must meet in order to receive disbursements.

- Serves as a guide for program implementation and management, so that MCA-Armenia Management Unit staff, Governing Council members, Stakeholders' Committee members, program implementers, beneficiaries, and other stakeholders understand the objectives and targets they are responsible for achieving, and are aware of their progress towards those objectives and targets during implementation.

- Establishes a process to alert implementers, stakeholders and MCC to any problems in program implementation and provides the basis for making any needed program adjustments.

This M&E plan is considered a binding document, and failure to comply with its stipulations could result in suspension of disbursements. It may be modified or amended as necessary only with the approval of MCC and if it is consistent with the requirements of the Compact and any other relevant supplemental legal documents.

# 2. Summary of the Program and Objectives

The economic livelihood of the more than one million Armenians living in rural areas, or 35 percent of the population, depends on agricultural production. In 2004, farm income accounted for more than 55 percent of the total income of rural households. With very few opportunities for off-farm employment, Armenia's rural population depends for survival on small farms.

At the time of Compact signature the impact of agricultural growth in reducing rural poverty in Armenia was much stronger than that of economic growth. In particular, data from household surveys showed that each percentage point of growth in agriculture during 2000-2004 resulted in a

reduction of 0.93 percent in rural poverty by 2004. Consequently, specific policies and investments aimed at promoting sustainable growth in agriculture were keys to reducing rural poverty.

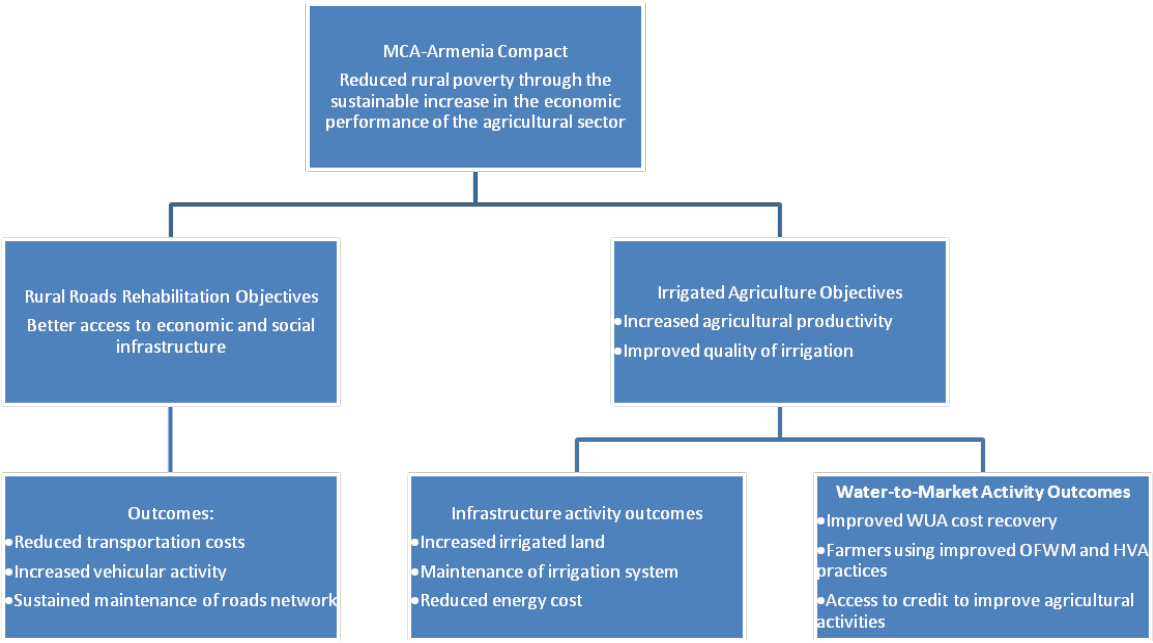
The direct aim of the Armenia Compact is to reduce rural poverty through better economic performance in the agricultural sector as a result of rural road rehabilitation and improved possibilities for irrigated agriculture. As indicated in Annex III of the Compact, impact evaluations will be designed to assess the extent to which rural poverty is reduced as a result of the Program activities.

Specific sub-activities for MCC funding were selected based on economic rates of return (ERRs) greater than or equal to the average of the economic growth rates in Armenia over the previous three years (12.5%)[1]. Further, the monitoring indicators for the two Projects are tied closely to the assumptions used in the revised economic analysis of the Projects.

Overall, MCA-Armenia Program included two projects: (1) Rural Roads Rehabilitation Project (RRRP) and (2) Irrigated Agriculture Project (IAP). The IAP in turn includes two activities and one sub activity:

(a) Irrigation Infrastructure Activity;
(b) Water to Market Activity (WtM); and
(c) Institutional Strengthening Sub-Activity.

The Objectives and Outcomes of the MCA-Armenia Program can be summarized as follows:




[1] This hurdle rate corresponds to MCC Guidelines for Economic Analysis as of November 2005.

During the Compact implementation, however, both RRRP and Irrigation Infrastructure have undergone significant changes and as a result the scope of their activities was reduced by two-thirds. Changes were mostly due to the devaluation of the US dollar against the Armenian Dram over the past three years and construction price escalation. While the Compact aimed at rehabilitation of 943 kilometers of rural roads or about one-third of Armenia's lifeline roads network (LRN), total length of which is 3,019 kms, after re-scoping MCA-Armenia would be able to rehabilitate only 297 kilometers of rural roads. Within the Irrigation Infrastructure activity construction of seven (7) reservoirs and eighteen (18) Gravity Schemes, as well as rehabilitation of 68 Pumping Stations, 198 kilometers of Main Canals and 588 kms of tertiary canals was envisioned under the Compact. However the re-scoped Irrigation Infrastructure Component does not include any reservoirs and the remaining outputs are reduced significantly. Moreover, following the decision of the June 2009 MCC Board meeting, the Rural Roads Rehabilitation Project of MCA-Armenia is still on hold.[2] This implies that the remaining road links planned under the MCA-Armenia RRRP will not be rehabilitated by the end of the Compact. As a result, the scope of the Program has been reduced significantly thus reducing the expected impact.

MCA-Armenia M&E Plan has been reviewed and modified after each re-scoping round to reflect the changes in the Program. While the output and outcome indicators for relevant projects/activities were revised after the re-scoping of each project/activity, the revision of the goal-level indicator targets was performed after all the projects were re-scoped, in March 2010, to reflect the changes in the scope of the program on MCA-Armenia expected impact on rural poverty and income.

Based on the beneficiary analysis described in detail in the Attachment E, MCA-Armenia Beneficiary Analysis, MCA-Armenia expects that the total number of beneficiaries benefitting from different interventions under the Compact (after re-scoping) excluding double-counting will equal **427,763**.

### (a) Project 1: Rural Road Rehabilitation (RRRP)

The objective of the MCA-Armenia Rural Road Rehabilitation Project is to ensure better access to economic and social infrastructure through rehabilitation of high priory rural roads in the road lifeline network. The original project economic rate of return (ERR) was 26%, which was based on data from pre-feasibility studies. During the project re-scoping, revised ERRs were calculated using data from the feasibility studies and designs. All of the road links included in the re-scoped project had ERRs that passed the 12.5% hurdle; however a new project ERR has not been re-calculated.

The expected project outputs as well as beneficiaries before and after project re-scoping and most recent changes are presented in the Table 1 below.

[2] In the press release dated June 10, 2009, MCC Board of Directors announced hold on funding for Armenia to remain in force, and stated that " MCC will not resume funding for any further road construction and rehabilitation" in Armenia.

| Table 1: MCA-Armenia Rural Roads Rehabilitation Project | | | |
|---|---|---|---|
| | **Compact** | **As of January 2008** | **As of July 1, 2009** |
| Road Sections Rehabilitated | 943 kms | 297 kms | 24.4 kms |
| Number of beneficiaries | 360,000 rural inhabitants | 142,909 rural inhabitants | 6,356 rural inhabitants |
| Number of beneficiary communities | 260 | 84 | 12 |

### (b) Project 2: Irrigated Agriculture (IA)

The objective of the MCA-Armenia Irrigated Agriculture Project is to increase agricultural productivity and improve the quality of irrigation through investments in irrigation infrastructure, training, technical assistance and increased availability of credits for farmers. The IA project consists of two separate activities: Irrigation Infrastructure and Water-to-Market. The original Irrigated Agriculture Project economic rate of return (ERR) was 25%, which was based on data from pre-feasibility studies and other data available during due diligence.

### Activity 1: Irrigation Infrastructure

For the Irrigation Infrastructure Activity, during the project re-scoping, revised ERRs were calculated using data from the feasibility studies and designs. All of the irrigation infrastructure components included in the re-scoped project had ERRs that passed the 12.5% hurdle; however a new project ERR has not been re-calculated.

Main information on the Irrigation Infrastructure Activity before and after re-scoping is presented in the Table 2 below.

| Table 2: MCA-Armenia IA Project: Irrigation Infrastructure Activity | | | |
|---|---|---|---|
| | **Compact** | **After Re-scoping in October 2008** | **As of July 1, 2009** |
| Reservoirs (number) | 7 | 0 | 0 |
| Gravity Schemes (number) | 18 | 7 | 5[3] |
| Pumping Stations (number) | 68 | 17 | 17 |
| Main Canals (kms) | 198 | 34 | 27,7 |
| Tertiary Canals (kms) | 588 | 220 | 220 |
| Drainage Systems (number) | 13 | 13 | 13 |
| Total Number of Beneficiaries[4] | 152,000 | 106,161 | 421,407 |
| Number of beneficiary communities | 362 | 286 | 298[5] |

[3] The number of gravity systems was reduced from 7 to 5 after the official project re-scoping because of concerns of technical and economic feasibility.

[4] The current beneficiary numbers are estimated based on the new approach which has been applied to make our beneficiary counts consistent with MCC new guidelines. As a result, the numbers presented in the column under "As of July 1, 2009" are based on *de facto* population numbers of the communities under the project, while the numbers for "Compact" and "Re-scoping" columns were based on the number of WUA members. For more on the approach to the beneficiary analysis, see the Annex E to the M&E Plan- MCA-Armenia Beneficiary Analysis.

**Activity 2: Water-to-Market**

The Water-to-Market Activity of the Irrigated Agriculture consists of two sub-activities: (a) Strengthening Irrigation System Entities; and (b) Improving the Profitability of WUA member farmers by:

- Providing member farmers with access to technology and training in on-farm water management and higher value agricultural (HVA) production;
- Providing training and consulting to individual member farmers, farmer groups and small and medium enterprises on post-harvest, processing and marketing investments;
- Building capacity within credit organizations and providing funding to such credit organizations which will on-lend to member farmers and related enterprises; and
- Building capacity of the end-borrowers.

The WtM ERR[6] was 15.5 %; however, in June 2009 the ERR was re-calculated to include data that had been collected during implementation to analyze the allocation of trainings between high-value agriculture and on-farm water management. The new ERR has been estimated at 22.5%. As a result of the analysis and on-the-ground experience by MCA-Armenia, the allocation of trainings has been adjusted, as shown below.

Main information on Improving the Profitability of WUA member farmers Sub-Activity of Water-to-Market Activity is presented in the Table 3 below.

**Table 3: MCA-Armenia IA Project: Improving the Profitability of WUA member farmers Sub-Activity of Water-to-Market Activity**

| | Compact | Revised after ERR revision in June 2009 | As of July 1, 2009 |
|---|---|---|---|
| Number of Farmers Trained in On Farm Water Management | 60,000 | 45,000 | 45,000 |
| Number of Farmers Trained in HVA | 30,000 | 36,000 | 36,000 |
| Number of Beneficiaries[7] | 38,350 | 28,834 | 28,834 |
| Number of beneficiary communities | N/A | 411 | 411 |

[5] The number of beneficiary communities is higher in July 2009 compared to October 2008, since the data on beneficiary communities have been updated based on the latest information available.

[6] Note, that this includes "Improving the Profitability of WUA member farmers" component only, which is usually referred to as Water-to-Market Activity (WtM)

[7] The WtM Activity beneficiaries are categorized under the "Targeted Projects" beneficiaries based on the new MCC Beneficiary Analysis Guidance. This basically means that only those farmers who according to the ERR estimates would adopt the practices taught during the trainings should be counted as beneficiaries. The number of beneficiaries is different from the Year 5 target because it accounts for farmers who will be trained in Year 5, but adopt new technologies in Year 6.

Strengthened irrigation system entities (also referred to as Institutional Strengthening Sub-activity (ISSA)) sub-activity of the WtM Activity is aimed to improve the productivity and sustainability of irrigated agriculture in Armenia. Institutional strengthening will be done primarily through in-service training, technical consultations and direct assistance activities that will build technical, managerial, institutional and financial capacities of WUA and their water users in irrigation system management.

# 3. Monitoring Component

Project and Activity performance will be monitored systematically, regularly, and on an on-going basis through the regular indicator tracking system. This analysis allows managers of MCA-Armenia and MCC to make programmatic adjustments as necessary with the view towards improving the overall impact of the Program.

Annex III of the Compact described the Compact Goal, Objectives, and Outcomes. This section of the M&E Plan builds on this information and includes a more defined outline of the plan for monitoring key indicators, including Output and Process Milestone Indicators. In addition, each implementer will monitor the inputs and outputs of each activity in a detailed manner. The M&E Officer in the MCA-Armenia Management Unit will be available for consultation and assistance in setting up each implementer's monitoring plan.

### *Indicators*

Project and Activity level outcomes will be measured by indicators. The Indicator Definition Tables in Attachment A provide a detailed definition of each indicator; unit of measurement, source of data, method of data collection, frequency of data collection, and the entity responsible for collecting the data.

The Output Indicators presented in the table are preliminary, and implementers may request revisions or propose modifications before beginning implementation of the relevant Activity. This M&E Plan will be amended to reflect any changes made to those indicators, after they have been approved by MCC.

Process Milestone Indicators have been introduced by MCC in early 2008 to serve as benchmarks against which to measure progress towards final outcomes in the early stages of Compact implementation. Relevant Indicators are added to this revised M&E Plan.

### *Baselines and Targets for Performance*

The baselines and targets for each indicator are shown in the Performance Tracking Tables in Attachment A. Targets are derived from the revised economic analysis justifying Program investments. The ERRs for Irrigation Infrastructure have been revised by the MCA-Armenia Economist and the Irrigation Team after the completion of feasibility studies during the Irrigation Infrastructure Re-scoping in 2008-2009. Targets for WtM Activity have been modified based on the Economic Analysis conducted by MCA-Armenia hired economist and finalized in June 2009. MCA-Armenia goal level indicator targets have been revised by an MCA-Armenia

hired economist in March 2010, after the re-scoping was finalized and almost all contracts for implementation were signed. Prior to implementation of a specific Activity, all baselines and targets relevant to that Activity should be specified, unless there are exceptions approved by MCC. If necessary, targets may be revised with written approval from MCC.

### *Disaggregating Data by Gender, Income, and Age*

The following indicators can be disaggregated by gender (of individuals or head of household), age, and/or income/consumption and will be reported in this manner to MCC:

Water-to-Market Activity

- Number of farmers using improved on-farm water management
- Number of farmers using HVA practices
- Training/technical assistance provided for on-farm water management
- Training/technical assistance provided for transition to high value added crops

Additional analysis will be conducted by gender, income and age, to be determined in concert with the detailed design of the impact evaluation.

### *Data Quality Reviews*

Data quality reviews will verify reported performance data by analyzing the accuracy, reliability, timeliness, and objectivity of performance data. The objective of any data quality review is to verify the quality and the consistency of performance data over time, across different implementers and reporting institutions. Such data quality reviews will also identify cases in which the highest degree of data quality is not possible, given the realities of the data collection circumstances. These assessments will cover data reported from implementers and other data sources as necessary, such as the National Statistical Service (NSS).

The particular objectives for the data quality reviews will be identification of the following parameters: i) what proportion of the data has quality problems (completeness, conformity, consistency, accuracy, duplication, integrity); ii) which of the records in the dataset are of unacceptably low quality; iii) what are the most predominant data quality problems within each field.

MCA-Armenia will contract the data quality reviewers in compliance with the Procurement Agreement. However, regardless of the thresholds for approval of TORs in the Procurement Agreement, MCC must approve the TOR for the data quality reviews.

The M&E Officer and other Officers, as appropriate, within the MCA-Armenia Management Unit should also regularly check data quality.

The entity responsible for data quality reviews has already been hired by MCA-Armenia in April 2008 and has conducted the reviews in April 2008- February 2010. An international expert has been hired by MCC to support the local Data Quality Reviewer in those aspects of the task that relate to the Integrated Survey of Living Standards conducted by NSS.

### *Progress Reports*

MCA-Armenia shall produce regular reports tracking the progress of each its Projects. Progress Reports will include data on the indicators described in the Monitoring Component and analysis of that data alongside with other information related to program success and lessons learnt. These reports will be made available to the public through MCA-Armenia's Quarterly Bulletins, MCA-Armenia website and other means of communication as they become available.

As part of its Quarterly Disbursement Request MCA-Armenia will submit Indicator Tracking Tables (ITT) to track interim progress toward compact goals. The ITT displays performance targets (projections) and tracks progress against them (actuals).All indicators at all levels of results hierarchy including low level output indicators and process milestones shall be included into the ITTs. For the full version of the MCC Guidance on the Quarterly Disbursement Request Package (QDRP) visit MCC website at www.mcc.gov.

An Annual Supplemental Report will provide additional information on accomplishments and developments of Compact implementation related to the consultative process, donor coordination, and lessons learnt. This report shall be approved by MCA-Armenia's Governing Council before it is submitted to MCC thirty days after the end of the US fiscal year.

MCA-Armenia will also prepare a final report called a **Program Completion Report (PCR)**. The PCR shall be prepared according to guidelines provided by MCC. The PCR should provide:

- A concise description of the Program from proposal to completion;
- A preliminary assessment of the Program's outcomes;
- Identification of beneficiaries including relevant characteristics, such as gender, age, and income level, and degree of participation;
- A preliminary assessment of the Program's sustainability-- that is, its likelihood to reach the future monitoring targets established as a measure of the projects' sustainability
- Lessons learned, including changes that might have been made in M&E criteria, policies, procedures and practices related to the program.

### *Linking Disbursements to Performance*

The M&E indicators tied to financial disbursements from MCC to MCA-Armenia are displayed below.

| **Rural Road Rehabilitation Project**[8] |
|---|
| International Roughness Index (IRI) for roads in Project area |
| Government budgetary allocations for rehabilitation of road sections in the road lifeline network |
| Road sections rehabilitated |
| **Irrigated Agriculture Project** |
| **Activity 1: Irrigation Infrastructure** |
| Government budgetary allocations for maintenance of irrigation system |

[8] Some of the RRRP CPs were already met by the time of MCC Board June 2009 decision, However, after the decision the RRRP-related CP are no longer in force.

| |
|---|
| Primary canals rehabilitated |
| **Activity 2: Water-to-Market** |
| Recovery of WUA operations and maintenance cost by water charges |
| Training/technical assistance provided for on-farm water management |

These indicators and their targets have been included in Schedule 1 to the Disbursement Agreement as conditions precedent. For each of these selected indicators, MCA-Armenia must come within 10% of the agreed upon target to receive that quarterly disbursement.

# 4. Evaluation Component

Evaluation is an essential element of the Armenia MCA Program. One of the key features of the MCC's approach to development assistance is its strong commitment to conducting rigorous impact evaluations of its programs, which employ, whenever possible, methodologies that determine whether results can be reliably attributed to MCC interventions. In addition, evaluation indicators can improve program management and provide lessons for future program implementation.

### *Interim and Final Evaluations*

The Program will be evaluated based on the extent to which the interventions contribute to the Compact Goal, which is to decrease rural poverty through improved economic performance in the agricultural sector. (The detailed Evaluation Plan is attached.)

MCA-Armenia will engage independent evaluators to conduct interim evaluations and final evaluations at the completion of the Program. Interim and final evaluations will be paid for from the Armenia M&E budget. These contracts are to be coordinated with complementary contracts paid for from the MCC budget.

Interim evaluation studies will assess progress in meeting the Compact goals, objectives and outcomes. They will provide early lessons learned and identify significant discrepancies between expected results and actual achievements, including an analysis behind the reasons for discrepancies between actual and projected indicators. The overall methodology to be used in the evaluation will be decided upon by the entity responsible for conducting the evaluation based on a prior, agreed-upon statement of work.

Final impact evaluations will address the following issues at a minimum and comply with MCC's guidance on final evaluations (forthcoming):

- Effectiveness of program activities in meeting Compact goals;
- Attribution of measurable outcomes to MCC interventions;
- Reasons behind the success or failure to achieve goals, objectives and targets;
- Unintended results of the program (positive and negative);
- Long-term sustainability of results;
- Re-estimated economic rates of return, comparisons to original estimates, and assessment of differences;
- Lessons learned applicable to similar projects.

### *Ad Hoc Evaluations and Special Studies*

MCC or MCA-Armenia may request ad hoc evaluations or special studies of Projects, Project Activities or the Program as a whole prior to the expiration of the Compact Term to be conducted by an outside entity contracted in compliance with the Procurement Agreement. Currently a number of such studies/evaluations have been initiated /conducted and include the following:

1. ***Agricultural Data Assessment*** to compare and contrast different sources of agricultural data so as to inform MCA-Armenia of the baseline state of the agricultural sector.
2. ***Qualitative Process Analyses*** that will complement the impact evaluation being conducted by another independent consultant. The process analyses will document the MCA-Armenia programmatic interventions, assess how they were implemented, and identify the strengths and weaknesses of the project/activity design and implementation. The qualitative process analyses may be used to fulfill the interim or final evaluation requirements described above.
3. ***Update of Poverty Projections*** that will inform MCA-Armenia as to how the changes in the scope of the Program and the revised calculations of the Economic Rate of Returns influence the anticipated program benefits and rural poverty/income indicator targets.
4. ***Estimate of "Total hectares under agricultural production with MCC support"*** to comply with the MCC common indicator requirement. This indicator includes hectares with MCC support including irrigation systems, agricultural inputs, credits, and technical assistance. To report on this indicator, MCA has to analyze which data sources can be used, but most likely it will be a combination of data from the WUA survey, RFF, and ACDI. The indicator will only be reported on once by MCA in year 5 of the Compact.

## 5. Assumptions and Risks

The Armenia MCA program logic is based on specific assumptions about the linkages between individual Project Activities and the goal of reducing rural poverty through increased economic performance in the agriculture sector. Assumptions inform the economic analysis (economic rates of return) while risks are external to program implementation, but are likely to affect program success.

| **Project 1: Rural Road Rehabilitation** | |
|---|---|
| **Assumptions** | **Risks** |
| MCA-Armenia will be able to rehabilitate all the road section that will yield sufficient economic returns. | Continuous dollar depreciation and increased construction input prices will result in a reduced program scope. |
| Vehicle operating costs will decline leading to increased vehicle use due to time savings and lower maintenance costs. | IRI improvements will lead to less than expected increases in traffic. |
| Better rural roads will lead to increased traffic bringing agricultural products to market. Public transportation will develop to improve the access of | Traffic will not increase due to lack of demand for products; public transportation does not improve due to insufficient demand at proposed prices so it |

| | |
|---|---|
| the population to social infrastructure. | is not easier for people to reach schools, hospitals, and other social infrastructure. |

| Project 2: Irrigated Agriculture | |
|---|---|
| **Assumptions** | **Risks** |
| **Activity 1: Infrastructure Rehabilitation** | |
| MCA-Armenia will be able to rehabilitate all the units of irrigation infrastructure that will yield sufficient economic returns. | Continuous dollar depreciation and increased construction input prices will result in a reduced program scope. |
| All activities and sub-activities in the original plan will be implemented fully allowing farmers to increase their irrigated land. | Upon full technical assessment, some irrigation activities, possibly reservoirs and rehabilitation of drainage system in the Ararat valley, will turn out to be too costly to implement, potentially due to environmental factors. |
| Farmers will cultivate their newly irrigated land, thereby increasing their income. | Farmers will not expand their use of land due to constraints in labor, capital, etc. or because they find employment outside of agriculture. |
| Farmers will consider irrigation more efficient, reliable and sustainable and will thus switch to higher value crops requiring effective irrigation. | Irrigation services will not improve sufficiently to lead to changes in crop patterns due to lack of trust on part of farmers or poor management. |
| Farmers will switch to higher value crops gradually over three years after the irrigation rehabilitation, thus increasing income. | Farmers will only switch to higher value crops after a lag of some years and some will not switch at all because of declines in crop prices, adverse weather conditions, lack of training, insufficient capital and/or risk aversion. |
| **Activity 2: Water-to-Market** | |
| Farmers will improve on-farm water management, plant higher yield crops, and use better post-harvest handling. | The take-up rates of one or more of the new methods will be less than anticipated due to risk-averse farmers. |
| Credit facilities will enable farmers to implement new techniques and increase food processing. | Poor management or other circumstances will lead to high loan default rates; credit will not be granted to farmers due to poor financial institutions or high interest rates, even when subsidized, leading to a lack of credit demand because farm profits will not cover the cost of the loans. |
| Farmers groups will develop, facilitating the use of storage facilities and sales to food processing facilities. | Farmers will be resistant to any type of cooperative action due to the past history of collectivization. |
| Farm income will increase due to use of new techniques. | Farm income will not increase due to price fluctuations, bad weather, middlemen profits, or other exogenous factors and employment gains will not be achieved. |
| Poor farmers will benefit from better access to markets. | Better rural roads will not raise farm gate prices but increase profits for intermediaries and/or lower prices for consumers. |

# 6. Implementation and Management of M&E

Before beginning implementation of the Projects and Project Activities, MCA-Armenia will orient staff and project implementers on how project performance is to be measured and will provide training necessary to comply with the M&E Plan. MCA-Armenia will also review comments and suggestions from beneficiaries, including the Stakeholders' Committee. MCC and MCA-Armenia may make adjustments to the M&E Plan as needed, provided any modification or amendment of the M&E Plan has been approved by MCC and is otherwise consistent with the requirements of the Compact and any relevant Supplemental Agreements between the Parties.

### *Responsibilities*

The general M&E responsibilities to be carried out by the Monitoring and Evaluation Officer (M&E Officer) of MCA-Armenia will include the following:

- Guide the establishment of the M&E system, including data-collection, data-analysis and reporting systems;
- Ensure that the M&E Plan and ERR analysis are modified and updated as improved information becomes available;
- Design the impact evaluation strategy in collaboration with MCC and external consultants;
- Collaborate with the Procurement Officer to prepare and conduct procurement of M&E contracts;
- Ensure that findings are disaggregated by gender, age, and income, as applicable;
- Participate in monitoring through site visits, review of program reports and secondary data;
- Facilitate learning exchanges and information dissemination;
- Organize and oversee regular independent data quality reviews.

### *Review and Revision of the M&E Plan*

The M&E Plan is designed to evolve over time, adjusting to changes in program activities and improvements in performance monitoring and measurement. In the fourth quarter of every year or as necessary, the M&E Officer of MCA-Armenia and representatives of the MCC M&E Division will review how well the M&E Plan has met its objectives. The review is intended to ensure that the M&E Plan measures program performance accurately and provides critical information on the need for changes in project design. The review is intended to ensure that the M&E plan:

- Shows whether the logical sequence of intervention outcomes are occurring;
- Checks whether indicator definitions are precise and timely;
- Checks whether M&E indicators accurately reflect program performance;
- Updates indicator targets, as allowed; and
- Adds indicators, as needed, to track hitherto unmeasured results.

The M&E Plan will be revised by MCA-Armenia, in agreement with MCC M&E, when the need for change has been identified in the review. The revised M&E Plan will be submitted to the MCA-Armenia Governing Council for approval (if changes are substantial) and to MCC for acceptance.

### *The Management Information System for M&E*

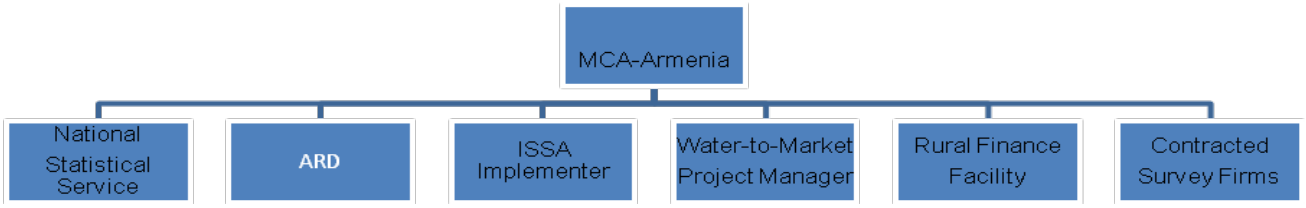
The MCC M&E Policy requires the MCAs to establish and maintain a management information system (MIS) to track program progress and monitor the effect of each activity with timely and accurate reporting. The MIS should be developed and implemented in agreement with MCC M&E.

Currently, MCA-Armenia Environmental and Social Assessment and Oversight Consultant (ESAOC) has hired a company to develop an MIS System for the overall MCA-Armenia Program. The M&E will have its part in the system. It is envisioned that the performance and implementation data will be stored on the system and timely progress reports will be generated.

In addition, the MIS will be used to prepare customized reports based on Program indicators. This will allow for the prompt publication of monitoring and evaluation data on the MCA-Armenia website in a standard format.

### *Coordination of M&E Data Gathering*

MCA-Armenia will receive data and reports from a variety of institutions, including project




implementers, the National Statistical Service and contracted survey firms. The following diagram displays the flow of information from these organizations to MCA-Armenia and the Indicator Definition Tables in Attachment A outline the information that will be collected and reported by each institution.[9]

[9] The diagram is meant to depict the flow of information, not the supervisory relationship of the organizations.

## 7. Budget

The proposed M&E activities for the five-year term of the Compact are estimated to amount to almost US$5.1 million.[10] The table below provides the breakdown of M&E activities by types and total cost over the life of the Compact.

**Armenia: Compact Budget for Monitoring and Evaluation** (in thousands of dollars)

| Activity | Total |
|---|---:|
| **Design and Oversight of the Monitoring System Indicators** | **240** |
| **Surveys for Impact Evaluation** | **2,452** |
| **Special Studies and Analyses** | **590** |
| **Other [11]** | **318** |
| **TOTAL** | **3,600** |

The M&E Plan also calls for coordinated funding using MCC resources to collaborate with MCA-Armenia analysts on the impact evaluations and to provide resources to complete the impact evaluations in 2012, the year after the Compact ends.

[10] The M&E budget excludes the salaries and travel of M&E staff in the MCA-Armenia Management Unit as these are included in the administrative budget.

[11] MCA-Armenia still needs to define a number of additional data collection efforts and studies required to monitor/evaluate the Program.

## Attachments:

### *A. Indicator Definition Tables and Performance Tracking Tables*

### *Indicator Definition Tables:*

| Compact Goal Indicators | | | | | | |
|---|---|---|---|---|---|---|
| **Program Goal** | **Indicator** | **Definition of Indicator** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| **Reduced rural poverty** | Poverty rate in rural areas | Poverty rate in rural areas as measured by the National Statistical Service of Armenia. | percentage | National Statistical Service | Household survey (ISLS) | annual |
| **Increased economic performance of the agriculture sector** | Change in real income from agriculture in rural areas | Change in real income from sale of agricultural produce per household member measured as an index. | Index, 2005 = 100 | National Statistical Service | Household survey (ISLS) | annual |

| Rural Road Rehabilitation Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicator** | **Units** | **Source/ Responsible Entity** | **Methodology** | |
| **Outcomes** | | | | | | |
| **Reduced transportation costs** | International Roughness Index (IRI) for pilot roads | Weighted index to measure road roughness (correlated with transportation costs) | m/km | Armenian Road Directorate | Pre and post-project measurement of road roughness | once after road completion |
| **Increased vehicular activity** | Average daily traffic on pilot roads | Average daily number of vehicles on pilot roads | numbers of vehicles | Armenian Road Directorate | Traffic surveys | once after road completion |
| **Sustained maintenance of road network** | Government budgetary allocations for rehabilitation of road sections in the road lifeline network | State budget expenditure on rehabilitation of road sections in the road lifeline network | AMD in millions | Armenian Road Directorate | State budget expenditure execution data | annual |
| | Government budgetary allocations for routine maintenance of the entire road | State budget expenditures on routine maintenance of the entire road network | AMD in millions | Armenian Road Directorate | State budget expenditure execution data | annual |

| | | | | | | |
|---|---|---|---|---|---|---|
| | network | | | | | |
| **Outputs** | | | | | | |
| **Kilometers of Roads Rehabilitated** | Road sections rehabilitated on pilot roads | Road sections rehabilitation completed – hand over certificates submitted and approved by MCA (pilot roads) | kilometers | Armenian Road Directorate | administrative; project implementation documents | annual |
| **Process** | | | | | | |
| | Package 1: Final Design and EA/EMP Documents for Package 1 | Date when SWECO (MCA Consultant) submits the Final Design and EA/EMP Documents for Package 1 to MCA. | date | MCA-Armenia | administrative; project implementation documents | once |
| | Package 1: Receive Mobilization Report from the Supervision Firm for Package 1 | Date when the Supervision Firm submits is Mobilization Report for supervision of Package 1 to MCA | date | MCA-Armenia | administrative; project implementation documents | once |
| | Package 1: Mobilization of Construction Contractor for Package 1 | Date when the Construction Contractor for Package 1 submits its Mobilization Report to MCA-Armenia. | date | MCA-Armenia | administrative; project implementation documents | once |
| | Package 2: Final Design and EA/EMP Documents for Package 2 | Date when SWECO (MCA Consultant) submits the Final Design and EA/EMP Documents for Package 2[12] to MCA. | Date | MCA-Armenia | administrative; project implementation documents | once |
| **Package 1** | Package 1: Percent of Work Complete (cumulative) | % of contract cost paid for Package 1 construction | percentage | MCA-Armenia | administrative; project implementation documents | quarterly |
| **Pilot Roads** | Pilot Roads: Percent of Work Complete (cumulative) | % of contract cost paid for pilot road construction | percentage | MCA-Armenia | administrative; project implementation documents | quarterly |

[13] MCA-Armenia will use the WUA and WU survey as an additional data source for comparing the data on this indicator.

| Irrigated Agriculture Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicators** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| **Objective** | | | | | | |
| **Increased agricultural productivity** | Increase in area covered by high value added (HVA) crops | Increase in hectares covered by HVA crops (i.e. vegetables, potato, fruits, and grapes) | hectares | Farming Practices Survey Consultant | Farming Practices Survey | annual |
| **Improved quality of irrigation** | Share of respondents satisfied with irrigation services | Share of respondents indicating that they have received enough irrigation water on time | Percentage | National Statistical Service<br>WUA Survey Consultant | Household Survey (ISLS)[13] | annual |
| **Activity 1: Irrigation Infrastructure** | | | | | | |
| **Outcomes** | | | | | | |
| **Increased irrigated land** | Additional land irrigated under Project | Annual increase in irrigated land in Project area | Hectares | WUA Survey Consultant | WUA Survey | annual |
| **Increased irrigated land** | Hectares under improved irrigation | Total number of hectares served by irrigation infrastructure that are either rehabilitated or constructed with MCC funding. These are hectares that currently have irrigation, but their irrigation is improved after the activity. | Hectares | WUA Survey Consultant | WUA Survey | annual |
| **Maintenance of irrigation system** | Government budgetary allocations for maintenance of irrigation system | State budget expenditures on maintenance of irrigation system | AMD in millions | State Water Committee | State budget expenditure execution data | annual |
| **Reduced energy costs** | Annual energy savings under Project | Reduction in Kilowatt hours used | thousand KWh | WUA Survey Consultant | WUA Survey | annual |
| **Outputs** | | | | | | |
| **Rehabilitation of primary canals** | Primary canals rehabilitated | primary canals rehabilitation completed | Kilometers | MCA-Armenia | administrative; project implementation documents | quarterly |

[13] MCA-Armenia will use the WUA and WU survey as an additional data source for comparing the data on this indicator.

| Irrigated Agriculture Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicators** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| **Rehabilitation of primary canals** | Primary canal structures constructed | primary canal structures constructed | Number | MCA-Armenia | administrative; project implementation documents | quarterly |
| **Renovation of pumping stations** | Pumping stations renovated | pumping stations renovated | Number | MCA-Armenia | administrative; project implementation documents | quarterly |
| **Conversion to gravity** | Conversion from pumping to gravity completed | conversion completed | Number | MCA-Armenia | administrative; project implementation documents | quarterly |
| **Rehabilitation of tertiary canals** | Tertiary canals rehabilitated | tertiary canal rehabilitation completed | Kilometers | MCA-Armenia | project implementation documents | quarterly |
| **Drainage in Ararat Valley** | Drainage systems rehabilitated | drainage system rehabilitation completed | Number | MCA-Armenia | project implementation documents | quarterly |
| **Process** | | | | | | |
| | Value of irrigation feasibility and/or detailed design contracts signed | The total value of irrigation feasibility and/or detailed design contracts signed | USD Millions | MCA-Armenia | administrative; project implementation documents | once |
| | Value of irrigation feasibility and/or detailed design contracts disbursed | The total value of irrigation feasibility and/or detailed design contracts disbursed | USD Millions | MCA-Armenia | administrative; project implementation documents | quarterly |
| | Value of all irrigation construction contracts signed | The value of signed contracts for works on irrigation infrastructure | USD Millions | MCA-Armenia | administrative; project implementation documents | quarterly |
| | Value of irrigation infrastructure contracted works disbursed | The total value of contracted works disbursed | USD Millions | MCA-Armenia | administrative; project implementation documents | quarterly |
| | Complete Environmental and Hydrological Study on the Ararat Valley | Date when MWH (MCA Consultant) submits the completed Environmental and Hydrological Study on the Ararat Valley to MCA-Armenia. | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Develop two options for Re-scoping of the Irrigation Infrastructure Activity | Date when MCA-Armenia jointly with its short-term consultant finalizes the first stage of the IAP re-scoping effort and proposes two alternatives for consideration | Date | MCA-Armenia | administrative; project implementation documents | once |

| Irrigated Agriculture Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicators** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| | Re-scope Irrigation Infrastructure Activity | Date when MCA-Armenia jointly with its short-term consultant finalizes the IAP re-scoping effort and produces a final report. | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Preliminary designs complete for drainage | Date when the preliminary designs for drainage are submitted to MCA | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Develop first EIA and/or RAP for the first gravity package of the Irrigation Infrastructure Activity | Date when the EIA and/or RAP developed by ESAOC (MCA Consultant) is submitted to MCA | Date | MCA-Armenia | administrative; project implementation documents | once |
| **Activity 2: Water-to-Market** | | | | | | |
| **Outcomes** | | | | | | |
| **Improved WUA cost recovery** | Recovery of WUA operations and maintenance cost by water charges | Share of WUA water charges compared WUA annual operations and maintenance cost | percentage | WUA Survey Consultant | WUA Survey | annual |
| **Improved ISF Collection Rate for 8 targeted WUAs** | Increased collection of Irrigation service Fee for the water used | Irrigation Service fee collection rate in 8 WUAs targeted by ISSA | percentage | WUA Survey Consultant | WUA Survey | annual |
| **Improved dispute resolution for 8 targeted WUAs** | Percentage of WUA disputes resolved by the Dispute Resolution Committee (DRC) for the 8 targeted WUAs | Share of Disputes resolved for 8 targeted WUAs compared to the average number of court cases in the 8 WUAs | percentage | ISSA Implementer | Administrative data | annual |
| **Farmers using improved on-farm water management** | Number of farmers using better on-farm water management | Farmers who have adopted and used, for a period of one crop year or more, one or more of the practices or equipment sets that are contained in the training packages | number | Water-to-Market Project Manager | Adoption Survey | annual |

| Irrigated Agriculture Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicators** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| **Farmers using improved HVA practices** | Number of farmers using better HVA practices | Farmers who have adopted and used, for a period of one crop year or more, one or more of the practices or equipment sets that are contained in the training packages | number | Water-to-Market Project Manager | Adoption Survey | annual |
| **Enterprises using improved PPM practices** | Number of enterprises that have applied improved techniques | Enterprises that have adopted and used one ore more practices/assistance types provided under the PPM component | number | PPM Adoption Survey Consultant | PPM Adoption Survey | year 5 |
| **Outputs** | | | | | | |
| **Access to credit to improve agricultural activities** | Loans provided | Loans provided under the Project | thousand dollars | Rural Finance Facility | administrative; project implementation documents | quarterly |
| **Training for on farm water management** | Training/technical assistance provided for OFWM | number of farmers trained in OFWM | number | Water-to-Market Project Manager | administrative; project implementation documents | quarterly |
| **Transition to higher value-added products** | Training/technical assistance provided for HVA | number of farmers trained in HVA | number | Water-to-Market Project Manager | administrative; project implementation documents | quarterly |
| **Post-harvest processing** | Training/technical assistance provided for PPM | number of enterprises/farmer groups assisted in PPM | number | Water-to-Market Project Manager | administrative; project implementation documents | quarterly |
| **Development of MIPs for WUAs** | MIPs developed | Number of developed MIPs for WUAs | Number of MIPs | ISSA | administrative; project implementation documents | quarterly |
| **Process** | | | | | | |
| | Sign IEA with the Rural Finance Facility | Implementing entity agreement (IEA) signed between the Rural Finance Facility and MCA-Armenia | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Conduct Initial Dutch Auction | Date when the initial dutch auction occurs for the access to credit sub-activity | Date | MCA-Armenia | administrative; project implementation documents | once |

| Irrigated Agriculture Project | | | | | | |
|---|---|---|---|---|---|---|
| **Purpose** | **Indicator** | **Definition of Indicators** | **Units** | **Source/ Responsible Entity** | **Methodology** | **Frequency of Data Collection** |
| | Develop an Action Plan for Capacity Building for Credit Providers | Date when the Action Plan for Capacity Building for Credit Providers is submitted by WtM PM to MCA-Armenia | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Develop an Action Plan for Capacity Building for Credit End-Borrowers | Date when the Action Plan for Capacity Building for Credit End-Borrowers is submitted by WtM PM to MCA-Armenia | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Conduct Second Dutch Auction | Date when the second dutch auction occurs for the access to credit sub-activity | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Complete Inception Report and Work Plan from the Institutional Strengthening Firm | Date when the newly hired Institutional Strengthening Firm submits its completed Inception Report and Work Plan to MCA-Armenia. | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Complete Institutional Strengthening Needs Assessment for WUAs | Date when WUA Needs Assessments completed by the Institutional Strengthening Firm is submitted to MCA-Armenia | Date | MCA-Armenia | administrative; project implementation documents | once |
| | Complete EMP annual update | Date when the WtM PM submits the annual update of the EMP to MCA-Armenia | Date | Water-to-Market Project Manager | administrative; project implementation documents | annual |

***Performance Tracking Tables:***

| Compact Goal Targets[14] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicators** | **Units** | **Baseline** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** |
| | | | | **2010** | **2011** | **2012** | **2013** | **2014** |
| **Reduced rural poverty** | Poverty rate in rural areas Baseline: 2008 | percentage | 22.9% | 22.9% | 22.8% | 22.1% | 21.6% | 20.9% |
| **Increased economic performance of the agriculture sector** | Change in real income from agriculture in rural areas Baseline: 2009 = 100 | Index | 100 | 100 | 100 | 104 | 107 | 111 |

| Rural Road Rehabilitation Targets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicator** | **Units** | **Baseline (2007)** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| **Outcomes** | | | | | | | | |
| **Reduced transportation costs** | International Roughness Index (IRI) for pilot roads | m/km | 14.16 | 14.16 | 4.00 | NA | NA | NA |
| **Increased vehicular activity** | Average daily traffic on pilot Roads | number of vehicles | 637 | 637 | 706 | NA | NA | NA |
| **Sustained maintenance of road network** | Government budgetary allocations for rehabilitation of road sections in the road lifeline network | AMD in millions | n/a | 1,010 | 3,150 | 3,310 | NA | NA |
| | Government budgetary allocations for routine maintenance of the entire road network | AMD in millions | n/a | 5,020 | 5,990 | 6,290 | NA | NA |
| **Outputs** | | | | | | | | |
| **Kilometers of roads rehabilitated** | Pilot road sections rehabilitated | kilometers | 0 | 0 | 0 | 24.4 | 24.4 | 24.4 |
| **Process** | | | | | | | | |
| | Package 1: Final Design and EA/EMP Documents for Package 1 | date | | | 18-Oct-07 | | | |
| | Package 1: Receive Mobilization Report from the Supervision Firm for Package 1 | date | | | 3-Apr-08 | | | |
| | Package 1: Mobilization of Construction Contractor for Package 1 | date | | | 30-Apr-08 | | | |
| | Package 2: Final Design and EA/EMP Documents for Package 2 | date | | | 30-Apr-08 | | | |

[14] The targets of the goal level indicators will be revised in Fall 2009 with consideration of the changes in the scope of the program, the revised economic analyses and the subsequent changes in those benefit streams that underlay the Compact estimates.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Package 1** | Package 1: Percent of Contracted Roads Works Disbursed | percentage | | 0 | 25 | NA | NA | NA |
| **Pilot Roads** | Pilot Roads: Percent of Contracted Roads Works Disbursed of Work Complete (cumulative) | percentage | | 0 | 50 | 90 | 100 | 100 |

| Irrigated Agriculture Targets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicator** | **Units** | **Baseline** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| **Increased agricultural productivity** | Increase in area covered by high value added (HVA) crops | Hectares (cumulative) | 0 | 0 | 0 | 112 | 561 | 1099 |
| **Improved quality of irrigation** | Share of respondents satisfied with irrigation services [15] | percentage | 49 % | NA | NA | NA | NA | NA |
| **Activity 1. Irrigation Infrastructure** | | | | | | | | |
| **Outcomes** | | | | | | | | |
| **Increased irrigated land** | Additional land irrigated under Project | Hectares (cumulative) | 0 | 0 | 0 | 0 | 500 | 1,767 |
| **Improved irrigation** | Total number of hectares served by irrigation infrastructure that are either rehabilitated or constructed with MCC funding. | Hectares | 0 | NA | NA | NA | NA | 69,111 [16] |
| **Maintenance of irrigation systems** | Government budgetary allocations for maintenance of irrigation system | AMD in millions | NA | 1,408 | 1,500 | 1,510 | 1,500 | 1,500 |
| **Reduced energy costs** | Annual energy savings under Project | thousand KWh (cumulative) | 0 | 0 | 0 | 0 | 0 | 1,375 |
| **Outputs** | | | | | | | | |
| **Rehabilitation of primary canals** | Primary canals rehabilitated | Kilometers (cumulative) | 0 | 0 | 0 | 1.3 | 15.2 | 27.7 |
| | Primary canal structures installed | Number of Structures (cumulative) | 0 | 0 | 0 | 78 | 244 | 244 |
| **Renovation of pumping stations** | Pumping stations renovated | Number (cumulative) | 0 | 0 | 0 | 0 | 0 | 17 |
| **Conversion to gravity** | Conversion from pumping to gravity completed | Number (cumulative) | 0 | 0 | 0 | 0 | 2 | 4 |
| **Rehabilitation of tertiary canals** | Tertiary canals rehabilitated | Kilometers (cumulative) | 0 | 0 | 0 | 6,5 | 120 | 220 |
| **Drainage in Ararat Valley** | Drainage system completed | Number (cumulative) | 0 | 0 | 0 | 0 | 0 | 13 |
| **Process** | | | | | | | | |

[15] The baseline for this indicator is calculated based on the following question "did you get enough irrigation water in time," included in the ISLS questionnaire. The baseline data are for 2007. This is a contextual indicator and MCA-Armenia hopes to observe some increase in satisfaction without having targets set.

[16] The target for this indicator is derived from the Irrigation Infrastructure ERRs revised during the Re-Scoping and includes the hectares that would benefit from improved irrigation under MCA/MCC funded Main Canals and Gravity Schemes, as well as pump stations that pump water for main canals.

| Irrigated Agriculture Targets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicator** | **Units** | **Baseline** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| | Value of irrigation feasibility and/or detailed design contracts signed | USD Millions | | NA | NA | NA | 4,522,864 | 4,522,864 |
| | Value of irrigation feasibility and/or detailed design contracts disbursed | USD Millions | | NA | NA | NA | 4,163,465 | 4,522,864 |
| | Value of irrigation construction contracts signed | USD Millions | | 0 | 0 | NA | 93,656,907 | 93,656,907 |
| | Value of irrigation infrastructure contracted works disbursed | USD Millions | | NA | NA | NA | 50,867,348 | 93,656,907 |
| | Complete Environmental and Hydrological Study on the Ararat Valley | Date | | | 31-May-08 | | | |
| | Develop two options for Re-scoping of the Irrigation Infrastructure Activity | Date | | | 31-May-08 | | | |
| | Develop first EIA and/or RAP for Irrigation Infrastructure Activity | date | | | 26-Sep-08 | | | |
| | Preliminary designs complete for drainage | Date | | NA | NA | 30-Sep-09 | NA | NA |
| **Activity 2. Water-to-Market** | | | | | | | | |
| **Outcomes** | | | | | | | | |
| **Improved WUA cost recovery** | Recovery of WUA operations and maintenance cost by water charges | Percentage | 36.7[17] | 36.7% | 38% | 42% | 53% | 60% |
| **Improved ISF Collection Rate for 8 targeted WUAs** | Increased collection of Irrigation service Fee for the water used | Percentage | 51%[18] | NA | NA | 51% | 53% | 55% |
| **Improved dispute resolution for 8 targeted WUAs** | Percentage of WUA disputes resolved by the Dispute Resolution Committee (DRC) for the 8 targeted WUAs | Percentage | 0.001%[19] | 0 | 0 | 0.001% | 5% | 15% |

[17] The baseline for this indicator is 2007.
[18] The baseline for this indicator is 2008, i.e. the year when ISSA started its activities.
[19] The baseline for this indicator is 2008, i.e. the year when ISSA started its activities. The target for this indicator will be calculated as 15% of the average number of law suits for the 8 WUAs. The average for the 8 WUAS for the baseline is 117 law suits, thus the target is that at least 15% of those cases is resolved by the DRC. This will not guarantee that the number of court cases will decrease (as there are disputes of different types, including legal cases). However, ISSA implementer expects that this might bring about the decrease of certain types of cases that go to the Court.

| Irrigated Agriculture Targets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicator** | **Units** | **Baseline** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| **Farmers using improved on-farm water management** | Number of farmers using better on-farm water management | number (cumulative) | 0 | 0 | 1,566 | 9977 | 19,032 | 25,954 |
| **Farmers using improved HVA practices** | Number of farmers using better HVA practices | number (cumulative) | 0 | 0 | 0 | 1,913 | 9,622 | 18,858 |
| Number of enterprises that have applied improved techniques | Enterprises that have adopted and used one ore more practices/assistance types provided under the PPM component | number (cumulative) | 0 | NA | NA | NA | 100 | 112 |
| **Outputs** | | | | | | | | |
| **Training for On-farm water management** | Training/technical assistance provided | number (cumulative) | 0 | 2, 453 | 15,574 | 29,700 | 40,500 | 45,000 |
| **Transition to higher value-added products** | Training/technical assistance provided | number (cumulative) | 0 | 0 | 2,982 | 15,000 | 29,400 | 36,000 |
| **Improved Post-harvest processing** | Training/technical assistance provided | number (cumulative) | 0 | 0 | 60 | 130 | 200 | 225 |
| **Access to credit to improve agricultural activities** | Loans provided | thousand dollars | 0 | 0 | 3,500 | 3,500 | 1,500 | 0 |
| **Development of Management Improvement Plans (MIPs)**[20] | MIPs developed | number (cumulative) | 0 | 0 | 0 | 26 | 44 | 44 |
| **Process** | | | | | | | | |
| | Sign IEA with the Rural Finance Facility | date | | | 16-Oct-07 | | | |
| | Conduct Initial Dutch Auction | date | | | 22-Feb-08 | | | |
| | Develop an Action Plan for Capacity Building for Credit Providers | date | | | 9-Apr-08 | | | |
| | Develop an Action Plan for Capacity Building for Credit End-Borrowers | date | | | 9-Jun-08 | | | |
| | Conduct Second Dutch Auction | date | | | 29-Sep-08 | | | |

[20] Given that the existing number of WUAs keeps changing, i.e. some WUAs are merging, please, note that the actual number of MIPs completed can be different due to the fact that there might not be as many WUAs as there were when the project started.

| Irrigated Agriculture Targets | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objectives** | **Indicator** | **Units** | **Baseline** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| | Complete Inception Report and Work Plan from the Institutional Strengthening Firm | date | | | 18-Apr-08 | | | |
| | Complete Institutional Strengthening Needs Assessment for WUAs | date | | | 31-Jul-08 | | | |
| | Complete EMP annual update | Date | | | 31-Sep-08 | 31-Sep-09 | 31-Sep-10 | |

### *B. Detailed Impact Evaluation Plan*

The rationale for impact evaluation is to establish clear attribution for effect of the program activities compared to a counterfactual. Approaches envisioned for the impact evaluation of each Project or activity are described below:

***Project 1: Rehabilitation of Rural Roads***

The impact evaluation plan for RRRP is currently under review because of the hold on MCC funding to complete the road rehabilitation. An impact evaluation of a rural roads rehabilitation project could provide important lessons for future MCC projects and the development community in general even if the entire road rehabilitation is not MCC funded. However, the evaluation is contingent on the Armenian government's ability to find additional funding for further road rehabilitation. In addition, even if funding is found, the original evaluation design (below) may no longer be technically feasible and MCC will have to decide at that point whether or not to continue with the impact evaluation.

**Treatment group**: Project beneficiaries are households in communities affected by MCA rural road rehabilitation Project.

**Control group**: Determined using pipeline analysis as most rural roads in Armenia are scheduled for rehabilitation, through the MCC Compact, Government and other donor funding. The control group would be comparable households in communities not in the first wave of MCC Compact rural road rehabilitation.

**Selection Method**: The communities would be selected using propensity score matching across waves of rural road rehabilitation, and households within the communities would be selected on a random basis.

**Baseline data collection**: Household surveys conducted by the National Statistical Service of Armenia, especially the 2007 Integrated Survey of Living Standards (ISLS).

**Interim data collection**: 2007-2009 ISLS including a larger sample of rural households.

**Final data collection**: 2010 ISLS including the larger sample of rural households.

**Methodology**: Quasi-experimental design based on pipeline analysis with double difference comparisons. The pipeline analysis will compare changes in key variables for communities that have had the rehabilitation of their roads completed to changes in key variables for those communities near roads that have not yet been rehabilitated. Pipeline analysis is feasible as the roads are divided into three packages: (i) mid 2007-mid 2008; (ii) mid 2008-mid 2009 and (iii) mid 2009-mid 2010. The key impact indicators are (i) the poverty rate in rural areas; (ii) the perceived poverty rate in rural areas; (iii) the change in real income from agriculture in rural areas; (iv) non-farm income of rural

households and (v) satisfaction with public transportation in rural areas. The analysis will investigate differences by gender, age, and consumption aggregate (as a proxy for permanent income), to the extent possible, realizing that the reliability of the estimates will decrease with increased disaggregation. In addition to using household data, the analysis will use community data to investigate related issues such as public transportation, business development, and social infrastructure. The final impact evaluation design will be developed through competitive bidding procedures and implementation will be conducted through cooperative activities by Armenian and US researchers.

***Project 2 - Irrigated Agriculture; Activity 1: Irrigation Infrastructure***

The rigorous impact evaluation for the irrigation infrastructure is focusing on the tertiary canal rehabilitation. Additional evaluations will be done for the other types of infrastructure (gravity systems, pumping stations, main canals, and drainage); however, they will not include a comparison group as the tertiary canal evaluation described below.

**Treatment group**: Project beneficiaries are households in communities affected by the MCA tertiary canal rehabilitation.

**Comparison group**: The comparison group will be comparable households in communities that are similar to the communities included in the tertiary canal rehabilitation activities.

**Selection Method**: The treatment communities were selected through an application process and the willingness of the communities to provide 15% of the investment cost. The comparison communities and households within those communities will be selected using local knowledge about irrigation conditions, crops grown, and farmer plot size.

**Baseline data collection**: The Tertiary Canal Survey (TCS) baseline was conducted from December 2009 to March 2010.

**Interim data collection**: A follow-up TCS will be conducted in December 2010 to March 2011.

**Final data collection**: The final TCS is scheduled to be conducted by MCC after the Compact in December 2011 to March 2012.

**Methodology**: Quasi-experimental design based on matching communities with double difference comparisons. The analysis will compare changes in key variables for communities that have had the rehabilitation of their tertiary canals completed to changes in key variables for matched communities that have not had their canals rehabilitated. The key impact indicators are (i) the change in household income and poverty; (ii) agricultural productivity; and (iii) quality and reliability of irrigation water. The analysis will investigate differences by gender, age, and consumption aggregate (as a proxy for

permanent income), to the extent possible, realizing that the reliability of the estimates will decrease with increased disaggregation.

***Project 2 - Irrigated Agriculture; Activity 2: Water-to-Market- On-Farm Water Management***

**Treatment group**: Project beneficiaries are farmers in Water Users Associations provided training in on-farm water management

**Control group**: Farmers in Water Users Associations who are not provided training in on-farm water management in the first four years of the Program.

**Selection Method**: Random assignment was conducted for the subset of villages that have adequate water and could potentially be served early in the Compact. Villages were randomly assigned to one of three groups: those who would be served in the second year of the Compact; those who would be served in either year 3 or year 4 of the Compact; and those who can be served in the final year of the Compact. The earliest group constitutes the treatment group, and the latest group the control group—impacts will be measured after the treatment group has been provided training but before the control group has. The middle group, those who are served in the third or fourth year, will not be included in the impact evaluation. Only villages that were considered ready for WtM training were included in the randomization; some villages currently have poor sources of water, and thus, would not benefit from training until their irrigation systems are rehabilitated. Such villages may receive training in the future, but they will not be included in the impact evaluation.

**Table 1. Distribution of Village Clusters by Year of Training and Agricultural Zone**

| | *Ararat Valley* | *Pre-Mountainous* | *Mountainous* | *Sub-Tropical* | ***Yearly Total*** |
|---|---|---|---|---|---|
| Year 2: Treatment | 44 | 58 | 12 | 6 | **120** |
| Years 3 and 4: Nonresearch | 18 | 19 | 38 | 2 | **77** |
| Year 5: Control | 28 | 38 | 10 | 4 | **80** |
| Total | 90 | 115 | 60 | 12 | **277** |

**Baseline data collection**: The Baseline Farming Practices Survey was fielded in December 2007-February 2008, when most of the Treatment Group communities had not yet received training. A sample of similar farmer households in communities not selected for training was also surveyed.

**Interim data collection**: Similar surveys will be fielded at the end of the harvest season each year in 2008, 2009 and 2010.

**Final data collection**: A similar survey may be fielded at the end of the final year of training.

**Methodology**: Random assignment ensures that, on average, treatment group villages and control group villages are the same, with the exception that treatment group villages are offered WtM training. Hence, the difference between the mean of the outcome of interest for the treatment group and the mean for the control group yields an unbiased

estimate of the WtM program's impact. While most of the outcome measures of primary interest to MCA-Armenia and MCC are longer-term outcomes, such as economic improvements, these outcomes may not be immediately observable. Consequently, both intermediate and final outcomes of interest will be examined. These outcomes are specified in Tables 2 and 3 below:

### Table 2. Intermediate Outcome Measures

| Intermediate Outcome Measures | Time Frame |
|---|---|
| ***Participation in Agricultural Training.*** Whether attended any irrigation or agriculture training (including training sponsored by other sources); type of training attended (e.g., classroom, video, or practical); whether received a certificate indicating the full training was attended. | Last Year |
| ***Adoption of HVA and Irrigation Practices.*** Which irrigation practices were used, focusing on those taught in training sessions; whether those practices had perceived time or labor savings. | Last Agricultural Season |
| ***Investment in Agricultural Technology or Equipment.*** Ownership of personal reservoir or water pump; ownership or rental of trucks, tractors, combines, seed planters, and sprayers. | Last Agricultural Season |
| ***Cropping Patterns.*** Specific crops grown, especially high-value crops; amount of land devoted to cultivation of each crop; total hectares of land devoted to crops; whether household cultivates a kitchen plot; reason(s) for changes in cropping patterns. | Last Agricultural Season |

### Table 3. Final Outcome Measures

| Final Outcome Measures | Time Frame |
|---|---|
| ***Continuing Use of HVA and Irrigation Practices.*** Same as above, but focusing on changes in these practices relative to the initial follow-up years. | Last Agricultural Season |
| ***Agricultural Production.*** Total amount of specific crops grown; amount of crops grown per square meter; total value of all crops cultivated. | Last Agricultural Season |
| ***Livestock.*** Number of cows, pigs, and sheep owned. | As of Survey Date |
| ***Revenue from Agricultural Production.*** Value of crops sold; total value of all crops (including those sold, bartered, or consumed). | Last Agricultural Season |
| ***Agricultural Costs.*** Expenditures on fertilizers, pesticides, irrigation water, hired labor, rented equipment, and taxes (individually and in total). | Last Agricultural Season |
| ***Profit from Agricultural Production.*** Revenues minus costs—the income from agricultural activities. | Last Agricultural Season |
| ***Income from Employment.*** Whether household head, spouse, and any grown children were employed (besides work on the family farm); total earnings from employment. | Last Month |
| ***Income from Pensions, Remittances, or Social Programs.*** Can also be added to profits and employment income to construct a rough measure of total income. | Last Month |
| ***Household Consumption.*** Expenditure on purchased food, health care, housing products, utilities, and transportation; cost of purchased goods (converted from monthly to annual) plus value of crops consumed by the household. | Last Month/Last Year |