

Document of  
The World Bank

FOR OFFICIAL USE ONLY

Report No: 77375-AF

RESTRUCTURING PAPER  
ON A  
PROPOSED PROJECT RESTRUCTURING  
OF  
ON-FARM WATER MANAGEMENT (OFWM) PROJECT  
ARTF GRANT  
TO THE  
ISLAMIC REPUBLIC OF AFGHANISTAN

April 2013

SASDA  
VPU

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

## ABBREVIATIONS AND ACRONYMS

ARTF	Afghanistan Reconstruction Trust Fund
CBA	Cost Benefit Analysis
DO	Development Objective
EA	Environmental Assessment
EIRP	Emergency Irrigation Rehabilitation Project
DAIL	Department of Agriculture, Irrigation and Livestock
IAMWARM	Irrigated Agriculture Modernization and Water-Bodies Restoration and Management Project
IDS	Irrigation Demonstration Site
IP	Implementation Progress
IRDP	Irrigation Restoration and Development Project
ISCT	Implementation Support Consultants Team
ITB	Invitation to Bid
MAIL	Ministry of Agriculture, Irrigation and Livestock
MTR	Mid-Term Review
O&M	Operations and Maintenance
OFWMP	On-Farm Water Management Project
PAD	Project Appraisal Document
PCPL	Precast Parabolic Lining
PDO	Project Development Objective
PIP	Project Implementation Plan
PIU	Project Implementation Unit
PMIS	Project Management Information System

Regional Vice President:	Isabel Guerrero
Country Director:	Robert Saum
Sector Manager:	Simeon Ehui
Task Team Leader:	Johannes Georges Pius Jansen

## RESTRUCTURING DATA SHEET

<b>1. Basic Information</b>	
Project ID & Name	P120398: On-Farm Water Management Project (OFWM)
Country	Afghanistan
Task Team Leader	Johannes Georges Pius Jansen
Sector Manager/Director	Simeon Ehui
Country Director	Robert Saum
Original ARTF Approval Date	01/18/2011
Original Closing Date:	06/30/2014
Current Closing Date	06/30/2014
Proposed Closing Date [if applicable]	
EA Category	B-Partial Assessment
Revised EA Category	B-Partial Assessment
EA Completion Date	11/11/10
Revised EA Completion Date	

<b>2. Revised Financing Plan (US\$ million)</b>		
<b>Source</b>	<b>Original</b>	<b>Revised</b>
BORR	0.00	0.00
COMM	0.00	0.00
ARTF	41.00	25.00
<b>Total</b>	41.00	25.00

<b>3. Borrower</b>		
<b>Organization</b>	<b>Department</b>	<b>Location</b>
The Islamic Republic of Afghanistan		Afghanistan

<b>4. Implementing Agency</b>		
<b>Organization</b>	<b>Department</b>	<b>Location</b>
Irrigation Directorate, Ministry of Agriculture, Irrigation and Livestock (MAIL)	Irrigation Directorate	Afghanistan

<b>5. Disbursement Estimates (US\$ million)</b>		
<b>Actual amount disbursed as of 12/31/2012 US\$ 6.10 million</b>		
<b>Fiscal Year</b>	<b>Annual</b>	<b>Cumulative</b>
2012	0.00	4.00
2013	9.00	13.00
2014	12.00	25.00
	<b>Total</b>	25.00

<b>6. Policy Exceptions and Safeguard Policies</b>	
Does the restructured project require any exceptions to Bank policies?	N
Does the restructured project trigger any new safeguard policies? If yes, please select from the checklist below and update ISDS accordingly before submitting the package.	N

<b>Safeguard Policy</b>	<b>Last Rating</b>	<b>Proposed</b>
Environmental Assessment (OD 4.01)	X	X
Natural Habitats (OP 4.04)		
Forestry (OP 4.36)		
Pest Management (OP 4.09)	X	X
Physical Cultural Resources (OP 4.11)		
Indigenous Peoples (OD 4.20)		
Involuntary Resettlement (OP 4.12)		
Safety of Dams (OP 4.37)		
Projects in International Waters (OP 7.50)	X	X
Projects in Disputed Areas (OP 7.60)		

<b>7a. Project Development Objectives/Outcomes</b>
<b>Original/Current Project Development Objectives/Outcomes</b>
The Project Development Objective (PDO) is to improve agricultural productivity in project areas by enhancing the efficiency of water used.

# AFGHANISTAN

## ON-FARM WATER MANAGEMENT (OFWM) PROJECT

Page

### Contents

A. SUMMARY .....	6
B. PROJECT STATUS.....	6
C. PROPOSED CHANGES .....	8
D. APPRAISAL SUMMARY .....	12
ANNEX 1 RESULTS FRAMEWORK AND MONITORING.....	17

# **AFGHANISTAN: ON FARM WATER MANAGEMENT PROJECT**

## **RESTRUCTURING PAPER**

### **A. SUMMARY**

This restructuring paper seeks the approval of the Afghanistan Country Director and the Administrator of the Afghanistan Reconstruction Trust Fund to introduce the following proposed changes to the On-Farm Water Management Project. The overall implementation of the project has been delayed significantly resulting in extremely poor utilization of Grant funds. In order to improve the disbursement profile and to bring the project to a satisfactory closure by its current Grant closing date of June 30 2014, the Mid-Term Review Mission carried out in February 2013 has recommended restructuring of the project to scale down the activities with a cancellation of US\$ 16 million from the original Grant amount of US\$ 41 million. After consultation with the Recipient, it was decided that the \$16 million would no longer be required for the Project as the activities originally envisaged under the Project would not be finalized before Closing Date. Accordingly, this proposed restructuring involves the scaling down of the size of the physical infrastructure investments to a level that can be reasonably expected to be completed by the Grant closing date. The revised target for command area serviced by on-farm infrastructure modernization would be 10,000 ha as opposed to the original target of 52,500 ha. In addition, as recommended by the MTR mission, the Grant Agreement would be modified to include the construction of five office buildings for the Ministry of Agriculture, Irrigation and Livestock (MAIL) to accommodate the Irrigation Directorate and on-farm water management staff at the five regional centers of Kabul, Herat, Mazar-e-Sharif, Baghlan and Jalalabad.

### **B. PROJECT STATUS**

The On-Farm Water Management Project (OFWMP) is currently a problem project with both DO and IP rating of Moderately Unsatisfactory. Overall implementation of the project has been significantly delayed in the almost two years following the ARTF Management approval in January 2011. The primary reason for this is the extraordinary delay in getting the Implementation Support Consultants Team on board. It took nearly a year to get these consultants mobilized and operational whereas they were supposed to have been in place right at the start of the project. In addition to this delay, the presence of an incompetent project director compounded to the poor performance and extremely slow disbursement. Now a more competent project director and the full ISCT are in place and the project is beginning to move. Overall, the project staff in the core team as well as in the regions has now gained reasonable experience in carrying out specific fundamental activities, i.e. scheme diagnosis, technical surveys, design preparation, cost estimation, and preparation of bid documents. There has been significant improvement in the quality of diagnostic reports. Likewise, quality as well as pace of conducting technical surveys and preparation of scheme designs has improved. However, as noted by the MTR mission, there is no way of achieving the original physical investment targets by the Grant closing date or by even a reasonable extension of the Grant closing date (see A2

below). This restructuring is being carried out to establish reasonable physical targets with corresponding reduction in the Grant amount, as discussed during the MTR.

The project has three main components: (A) on-farm water management in five project areas (Kabul region, Baghlan region, Balkh region, Herat region and Nangarhar region) covering approximately 50,000 ha; (B) institutional strengthening and capacity building of MAIL; and (C) project management, coordination and monitoring & evaluation.

Component A has three sub-components:

**A1: Establishment and Strengthening of Irrigation Associations:** Out of 175 associations to be established and registered legally within the framework of the 2009 Afghan Water Law, 170 associations have been established and registered. However, none of the activities associated with training these IAs and strengthening them to carry out their responsibilities has been initiated. Given that the Irrigation Associations have been established, further support to this component would be continued under the proposed restructuring.

**A2: Improvement of on-farm physical irrigation infrastructure (tertiary networks):** In June 2012, the Bank team assessing the poor performance of this component worked out a revised schedule for implementation of physical infrastructure component. This schedule was referred to as the “relaxed fit” and required until end 2015 to complete this component. However, the MTR mission found that there was substantial slip in meeting even this “relaxed fit” and recommended the restructuring of the project. Even though 97 schemes are reported to have been technically surveyed only 41 schemes have been designed and approved so far against a “relaxed fit” target of 65 schemes as at end-January 2013. The command areas associated with these schemes are far below the estimated values used in the original project – only about 7,000 ha have been designed so far as against a target value of about 12,000 ha. In addition, the “relaxed fit” targets for (i) bid documents prepared and cleared; (ii) ITB and bid docs received; (iii) bids evaluated and cleared; (iv) contracts awarded; (v) construction on-going; and (vi) construction completed have been missed by large margins (see table below).

**Table – Targets versus Achievements as of end January 2013**

Item	“Relaxed Fit” Target Values until end January 2013	Achievements until end January 2013
Bid Documents Prepared and Cleared	55	41
ITB and bids received	45	27
Bids evaluated and cleared	35	18
Contracts awarded	30	18
Construction Supervision-Ongoing schemes	25	2
Construction completed	10	2
Command area covered (ha) in completed schemes	About 3000	About 360

In the two schemes where on-farm works have been completed, farmers were very appreciative of the improvements brought by the intervention in terms of improved

reliability and efficiency of water delivery. Nevertheless, further improvements can be made, e.g. installation of check structures in the main channel for which farmers are currently reluctant despite motivation by project staff.

**A3: Demonstration and dissemination of improved water saving techniques:**

Dissemination of water savings techniques and technologies through establishment of 25 Irrigation Demonstration Sites (IDS) within command areas of project schemes is one of the key project components. During the MTR, it was noted with concern that this is still a weak activity, which needs to be planned properly and undertaken effectively during the remaining project period. One satisfactory aspect noted by the mission was that laser land leveling demonstrations have attracted a lot of attention from farmers. Given the importance of demonstration of improved water saving techniques in achieving the development objective, further support would be provided during the proposed restructured project.

**B: Institutional strengthening and capacity building of MAIL:** Limited numbers of MAIL and OFWM project staff have been trained at the Water Management Training Institute (WMTI) in Lahore. However this training has not yet produced any tangible improvements in the skills of the MAIL, DAIL and OFWM staff. Another batch of trainees has started training in Lahore in April and the Institute has been requested to provide focused training at this time. In general there has been total lack of coordination and consultation between the OFWM project management and the Irrigation Directorate of MAIL. However, given the importance of capacity building, this component will be supported in the restructured project.

**C: Project management, coordination and monitoring & evaluation:** With the appointment of the new project director in July 2012, project management has improved. Substantial progress has been made in establishing the PMIS. A good system for tracking physical progress of works has been developed. Further work is required to convert this to a web-based system and to include all indicators as per the final baseline survey questionnaire of the M&E work. Based on this encouraging sign, further support would be provided in the restructured project for this component.

### **C. PROPOSED CHANGES**

The project development objective (PDO) is to improve agricultural productivity in project areas by enhancing the efficiency of water used. The PDO is not changed in this restructuring.

- Results/indicators

The Results framework and monitoring indicators have been modified to reflect more accurately the measurement of project progress and achievement of project objectives. The revised indicators are provided in Annex 1. In summary, indicators have been introduced to measure the adequacy of training imparted to IAs, command area benefitting from physical infrastructure improvement, adaptation of technology demonstrated through the project, and the impact of the capacity building initiatives on the skills enhancement and performance of MAIL, DAIL and OFWMP staff.

- Components

**Component A1** is maintained as in the original emergency project paper. The project management would be advised to prepare a work plan for the remainder of the project to effectively train the IAs in their duties.

**Component A2** would be substantially downsized to have a realistic target of infrastructure modernization and associated benefitting command area. US\$ 16 million would be cancelled and the target command area would be reduced from the original 52,500 ha to 10,000 ha. The associated number of schemes is estimated to be approximately 50 and the improvements to the tertiary physical infrastructure would be completed by the current Grant closing date of June 30, 2014. The scheme selection criteria are slightly modified to allow schemes whose headworks and primary and secondary canals are in good operating condition as certified by the OFWM Project Director - whether they have been rehabilitated under the Bank-financed Emergency Irrigation Rehabilitation Project (EIRP) or not. The original emergency project paper allowed only those schemes which had been modernized under the former EIRP. In addition, the schemes need not be equally distributed among the five regions as proposed in the original project paper. The emergency paper had also recommended the precast parabolic concrete lining as a preferred lining method. This is now modified to allow other materials and forms of lining appropriate for the specific scheme and which could be completed in a short period of time by local contractors.

**Component A3** remains unchanged except to incorporate the MTR mission recommendations which are summarized below. The MTR mission suggested to the project management to develop a comprehensive time-bound site-specific, crop-specific irrigation demonstration plans for each region keeping in view that:

- (i) IDSs should be established only in the schemes to be taken up for rehabilitation in the remainder of the project period.
- (ii) The focus should be on representative crops of the area and the specific interventions demonstrated should be site-specific – e.g. drip and sprinkler where orchards are the major activity, land leveling and furrows in areas where cereal crops are a major activity, etc.
- (iii) The type of activity to be demonstrated should be replicable in the vicinity.
- (iv) DAIL staff should be fully involved in all irrigation demonstration activities.
- (v) There should be a small sign-board at each IDS indicating brief details of the technology being demonstrated to inform other farmers in the scheme.
- (vi) Selection of farms and farmers whose land would be used for IDS should follow the norms specified in the emergency paper as well as the Project Implementation Plan (PIP).
- (vii) The plot sizes should be large enough to correctly identify the benefits. Doing a laser land leveling demonstration in one or two jeribs (jerib = 0.2 ha) of land, for instance, is not the best method. Plot sizes up to 5 jeribs (1 ha) should be considered.

These changes would allow the project to pilot the physical infrastructure modernization and on-farm irrigation demonstrations efficiently and fully utilize the remaining funds allocated for this component.

**Component B** is modified to include the construction of five office buildings – one each in Kabul, Herat, Mazar-e-Sharif, Baghlan and Jalalabad – to accommodate the Irrigation Directorate staff in the DAILs and the OFWM staff in the project Area Teams. Training of Kabul-based Irrigation Directorate staff as well as relevant DAIL staff is to be strengthened. Training at the WMTI in Lahore (Pakistan) and Roorkee Institute in India has been completed. A team of agronomists visited the Bank-financed IAMWARM project in Tamil Nadu, India to learn the SRI method of rice cultivation. These exposure visits as well as attendance at short courses in the region would be a focus under this component during the remainder of the project period. The buildings would be constructed utilizing the savings under this component and there would be no cancellation under this component. The bid documents for the buildings have already been approved by the Bank and bids have been called for. Work on these buildings is expected to start in June 2013 in order to be completed before June 2014.

**Component C** remains unchanged.

- Financing
  - Project Costs

Project Costs (US\$ million)		
Components/Activities	Current <sup>1</sup>	Proposed
<b>Component A: On Farm Water Management</b>	25.2	9.2
<b>Component B: MAIL institutional strengthening and capacity building</b>	4.1	4.1
<b>Component C: Project management, monitoring and evaluation</b>	6.2	6.2
Physical and Price Contingencies	5.5	5.5
<b>Total Cost</b>	<b>41.0</b>	<b>25.0</b>
Requested ARTF Financing	<b>41.0</b>	<b>25.0</b>
<b>Total Funding</b>	<b>41.0</b>	<b>25.0</b>

- Financing Plan

In the emergency project paper, a small amount of community contribution was included. However, most of the community contribution is in kind and hence this element is now deleted in the financing plan with all funds coming from the ARTF. The financing plan has been revised in the data sheet.

<sup>1</sup> If the project has had a previous restructuring, the current should reflect the latest approved costs.

**Details of changes in financing plan after restructuring**

Category of Expenditure		Allocation		% of Financing	
Current	Revised	Current	Revised	Current	Revised
Goods	Goods	2.5	2.5	6.1	10.0
Works	Works	20.2	6.6	49.3	26.4
Consultants' Services	Consultants' Services	12.5	10.1	30.5	40.0
Training	Training	2.3	2.3	5.6	9.2
Incremental Operating Costs	Incremental Operating Costs	3.5	3.5	8.5	14.0
Total		41.0	25.0	100%	100%

**Summary of financing plan after restructuring**

Category	Amount of the Grant Allocated (expressed in USD)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods and consultants' services for the Project (except for Parts A.2 and A.3); Training and Incremental Operating Costs under the Project	19,000,000	100%
(2) Goods, works and consultants' services for Part A.2 and A.3 of the Project.	6,000,000	100%
Subtotal		
Cancelled as of May 6, 2013	16,000,000	
<b>TOTAL AMOUNT</b>	<b>25,000,000</b>	

- Cancellations  
US\$ 16 million will be canceled from the Grant resulting in a revised Grant amount of US\$ 25 million. The entire cancellation will be from Component A2. The financial allocations for all the other components remain unchanged. The cancellation is initiated by the Bank but after consultation with the Recipient. As indicated previously, with the scaling down of the Project, these funds are no longer required.

- Procurement

The potential for delays in bidding and contract award processes affecting the ability of the project to meet the proposed reduced targets remains significant. Background checks as well as verification of documents and bank guarantees submitted by contractors need to be expedited. The MTR mission has recommended that the project management should consider alternate arrangements for execution of civil works such as community contracting where feasible.

## **D. APPRAISAL SUMMARY**

- Economic and financial analysis:

### **Cost-Benefit Analysis of the Project after restructuring**

A revised cost-benefit analysis (CBA) was conducted for the restructured project. The restructuring consists of a scaling down of Component A2 to 10,000 ha while basically leaving Components B and C unchanged. As in the original CBA, the calculations were performed on a per hectare (ha) basis at two levels, i.e. farmer level and project level. Regarding benefits, only the expected crop yield increase was taken into account, i.e. even though the project is expected to also lead to increases in area irrigated and (in some areas) may even lead to an increase in the number of cropping seasons, these additional benefits are difficult to quantify at this point in time and are therefore left out. Given that wheat is the dominant crop in Afghanistan, the revised CBA was carried out taking wheat as an example. Secondary statistics suggest an average baseline (without project) yield of 2.5 metric tons (MT) per ha. In conducting our CBA we used a conservative 15% yield increase as a result of the project's activities – even though information regarding the effect of investments in irrigation from other projects (e.g. EIRP, IRDP) as well as interviews with farmers point towards yield increases in the order of 25% or larger. A price of \$0.35/kg was used which reflects the average farm gate price of wheat in Afghanistan over the past 12 months. The CBA takes into account only the first ten years of cash flows, i.e. any positive cash flow occurring after year 10 is ignored in the analysis, thus making the resulting returns an even more conservative estimate of what actually could be achieved. In both the CBA at farmer's level and CBA at project level it is assumed that in the absence of the project, investment costs would amount to 10% of the total investment cost with the project.

Regarding costs and consistent with the figures used in the original CBA carried out during project appraisal, an average per ha investment cost of \$325 was used for civil works (all in year 1 of the cash flow analysis). This is the major portion of Component A2 of the project (water management infrastructure). For the farm level CBA the following additional cost items were taken into account: (i) costs of Component A1 (establishing and strengthening of Irrigation Associations (IAs) budgeted at U\$ 1,445,500; (ii) costs of Component A3 (irrigation demonstration sites (IDS) budgeted at U\$ 867,500; and (iii) O&M costs incurred by farmers. Consistent with the figures used in the original CBA, a cost of \$2.58/ha/year was included for O&M with the project and \$5.38/ha/year without the project.

It is important to note that even though significantly fewer schemes than the original 175 will be completed by the closing date of the project, IAs were established and registered, and continue to receive training in all 175 schemes. Similarly, IDS will be established to the extent originally planned in the project (25 in total). However and as of March 1, 2013 (following the month of the MTR), 20 months had elapsed in the project which therefore had 16 months left until closure on June 30, 2014. Therefore, the costs incurred for Components A1 and A3 during the first 20 months can be considered as sunk costs. As a result only 44% (16/36) of the total costs for (i) and (ii) above were taken into

account in the revised CBA. In this way capacity building cost at the farmer level work out to US\$ 103/ha based on 10,000 ha of irrigation improvement works.

The project level CBA has all of the cost items that were included for the farm level analysis (i.e. (i)-(iii) above), plus the following: (iv) the non-physical works portion of Component A2 that supports the implementation of physical works in the field budgeted at \$5,241,500; (v) cost of Component B1 (institutional strengthening of MAIL) budgeted at US\$ 1,500,000; (vi) costs of component B2 (training of project, MAIL and DAIL staff) budgeted at US\$ 1,518,225; (vii) costs of component C (Project management, coordination, monitoring & evaluation) budgeted at US\$ 7,114,700.

Cost items (iv)-(vii) above will remain unchanged under the restructured project. That is, the institutional part of Component A2 is lumpy and to a certain extent is independent of the number of hectares to be rehabilitated under the project. Institutional strengthening (cost item (v) above) and capacity building (cost item (vi) above) will continue in the restructured project as planned for the original project. Finally, since both the PIU and Area Teams will continue as planned and M&E activities are under way, cost item (vii) will also remain intact. However and based on the same sunk cost argument used for cost items (i)-(iii), the costs associated with items (iv)-(vii) were also reduced by 56% in the revised CBA. This way and again based on 10,000 ha of rehabilitation of irrigated areas, the costs of investments in capacity building at the project level work out to be US\$ 134/ha whereas project management costs are US\$ 549/ha.

Based on the above, the restructured project continues to generate a healthy return at the farmer level (IRR of 77%) whereas the return at the project level also substantially exceeds the opportunity cost of capital (IRR of 18% vs. discount rate of 12%). The corresponding net present values (using a discount rate of 12% which being on the high side adds to the conservatism of the CBA) would be \$637/ha and \$160/ha. Remember that all of this is based on otherwise conservative assumptions regarding the expected benefits of the project, i.e. a conservative yield increase of 15% and no expansion of irrigated area or number of cropping seasons.

#### *Sensitivity analysis*

Just as in the original CBA, a number of sensitivity analyses were carried out around the base values for yield increase, wheat price and costs of rehabilitation works. If an increase in wheat yield of 25% (instead of 15%) would be achieved (based on previous experiences of other projects this seems quite feasible) then the IRR would jump to 222% for the farm level (table A1) and 40% for the project level (table A2). The corresponding NPVs would be \$1156/ha and \$679/ha for the farm and project level, respectively. In the (highly unlikely) scenario of no wheat yield increases, the IRR at the farm level would be zero while the project level IRR would turn negative (-11%). On the other hand, even if the cost of rehabilitation works would be 25% higher than projected, the financial returns to the project would remain attractive, i.e. the IRR would be 59% at the farm level (table A1) and 16% at the project level (table A2), with corresponding NPVs of \$613/ha and \$135/ha, respectively.

Similar sensitivity analyses were carried out for variations in the farm gate price of wheat; the important message here is that even if the wheat price would fall 20% below

its current level (a highly unlikely scenario given the current state of national and international grain markets), the project would still generate IRRs that exceed the discount rate. In general the project’s financial returns are much more sensitive with respect to wheat yield than to either wheat price or investment cost (see figures A1 and A2).

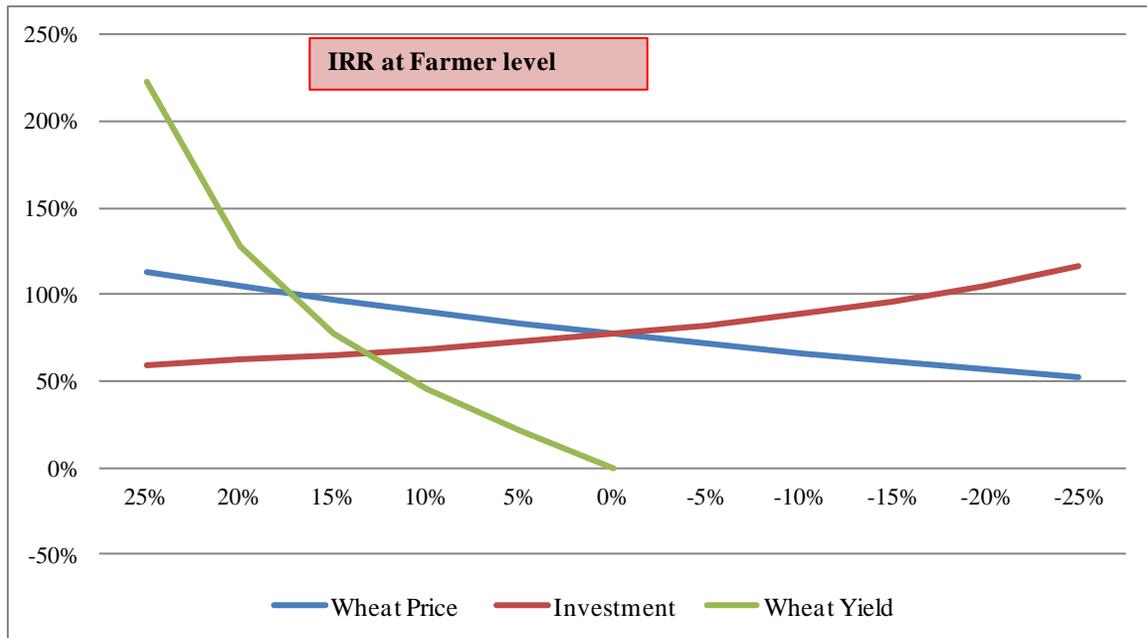
A “pessimistic” scenario was also analyzed in which the per ha investment cost for infrastructure works is 20% higher than the base value, the farm gate price of wheat is 20% below its base value, and the increase wheat yield is limited to 10%. In that case the IRRs at farmer and project levels decrease to respectively 30% and 5% with corresponding NPVs of \$254/ha and -\$224/ha. Whereas such a “pessimistic” scenario is highly unlikely to happen, the farmer level IRR and NPV remain acceptable - even if the project as a whole no longer provides an attractive return.

In conclusion, even under a set of rather conservative assumptions regarding expected benefits, the restructured project which will rehabilitate 10,000 ha of irrigated land continues to yield attractive returns which are also quite robust with respect to possible adverse deviations from the base values regarding wheat yield, wheat price and the cost of rehabilitation of irrigation infrastructure.

**Table A1:** Expected IRR at farmer level under different assumptions regarding investment costs and wheat price and yield

<b>IRR Farmer level</b>			
Deviation from base	IRR		
	Wheat Price	Wheat Yield	Investment
25%	112%	222%	59%
20%	104%	128%	62%
15%	97%	77%	65%
10%	90%	45%	69%
5%	83%	22%	73%
0%	77%	0%	77%
-5%	72%		82%
-10%	66%		89%
-15%	61%		96%
-20%	57%		105%
-25%	52%		116%

**Figure A1:** Expected farm level IRR (vertical axis) under different assumptions regarding deviations from baseline values for investment costs and wheat yield and price (horizontal axis)

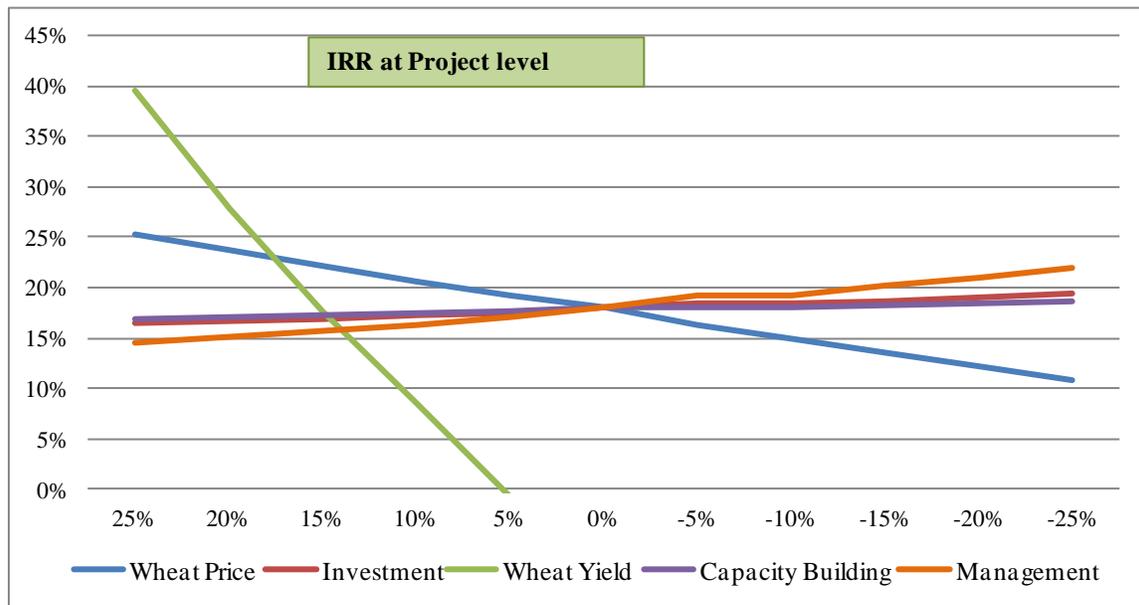


**Table A2:** Expected IRR at project level under different assumptions regarding investment costs and wheat price and yield

IRR Project level						
Deviation from base	IRR					
	Wheat Price	Wheat Yield	Investment	Capacity		
				Building	Management	
25%	25%	40%	16%	17%		14%
20%	24%	28%	17%	17%		15%
15%	22%	18%	17%	17%		16%
10%	21%	8%	17%	17%		16%
5%	19%	-1%	17%	18%		17%
0%	18%	-11%	18%	18%		18%
-5%	16%		18%	18%		19%
-10%	15%		18%	18%		19%
-15%	14%		19%	18%		20%
-20%	12%		19%	18%		21%
-25%	11%		19%	19%		22%

**Figure A2**

Expected project level IRR (vertical axis) under different assumptions regarding deviations from baseline values for investment costs and wheat yield and price (horizontal axis)



- **Technical:**

The scheme selection criteria have been modified to include those schemes whose primary and secondary canals are in good operating condition whether they have been improved by the former Bank-financed Emergency Irrigation Rehabilitation Project or not. In addition based on the experience gained in the limited progress made in physical infrastructure improvement, it has been decided to proceed with all lining options relevant to the local conditions and not insisting on the PCPL segments.

- Social: **No Change**
- Environment: **No Change**
- Exceptions to Bank Policy: **No Change**
- Risk: **No Change**

**ANNEX 1**  
**Results Framework and Monitoring**

**I. Results Framework**

**Table A1.1 Outcomes and Indicators**

<b>PDO</b>	<b>Project Outcome Indicators</b>	<b>Use of Project Outcome Indicators</b>
Improved agricultural productivity in project areas by enhancing the efficiency of water used	<ul style="list-style-type: none"> <li>• Land productivity of wheat and other crops in project areas</li> <li>• Water productivity of wheat in project areas</li> <li>• Irrigated area increase due to project interventions</li> </ul>	<ul style="list-style-type: none"> <li>• To assess if project has achieved its development objectives</li> <li>• Improve management of project activities</li> <li>• To assist designing future interventions</li> </ul>
<b>Intermediate Outcomes</b>	<b>Intermediate Outcome Indicators</b>	<b>Use of Intermediate Outcome Monitoring</b>
Component A: On Farm Water Management		
Irrigation Associations (IAs) established and strengthened	<ul style="list-style-type: none"> <li>• Number of IAs formed</li> <li>• Training sessions provided to each IA including contents of such sessions</li> </ul>	<ul style="list-style-type: none"> <li>• To improve O&amp;M by water users</li> </ul>
Improved on-farm physical irrigation infrastructure	<ul style="list-style-type: none"> <li>• Length of watercourses rehabilitated</li> <li>• Associated command area covered</li> <li>• Conveyance efficiency % (a measure of water loss)</li> <li>• Conveyance duration</li> <li>• Time to divert water to farmers field</li> </ul>	<ul style="list-style-type: none"> <li>• To verify adequacy of rehabilitation works resulting in improved water flow to farmers' fields</li> <li>• To continue improving rehabilitation designs based on experience in already completed schemes</li> </ul>
Irrigation demonstration sites established to disseminate water	<ul style="list-style-type: none"> <li>• Number of irrigation demonstration sites</li> </ul>	<ul style="list-style-type: none"> <li>• To verify relevance of irrigation and agronomy</li> </ul>

PDO	Project Outcome Indicators	Use of Project Outcome Indicators
saving measures	<ul style="list-style-type: none"> <li>• Number and type of water-saving measures demonstrated at each site</li> <li>• Number of farmers participating in demonstrations</li> <li>• Number of farmers adopting the demonstrated measures</li> </ul>	technologies demonstrated
Component B: MAIL Institutional Strengthening and Capacity Building		
MAIL strengthened to implement OFWM works	<ul style="list-style-type: none"> <li>• Number of MAIL, DAIL and OFWMP persons trained on OFWM principles and designs</li> <li>• Proportion of rehabilitated schemes obtaining at least “satisfactory” rating from irrigation water users</li> </ul>	<ul style="list-style-type: none"> <li>• To track progress in capacity building in MAIL regarding OFWM</li> <li>• To verify quality and relevance of rehabilitation works</li> </ul>

## II. Arrangements for Results Monitoring

The framework for project monitoring, learning, and evaluation (M&E) is designed to facilitate: (a) a results-based management approach that is informed by feedback from timely monitoring of project activities, processes, outputs, and outcome indicators; (b) continued capacity building and learning through a mix of formal trainings and participatory processes such as joint assessments between the Project Area Teams, Irrigation Associations, and third-party supervising agency; and (c) impact assessment, which primarily involves measuring the impact of the project on a clearly defined set of outcome indicators and good survey data.

### Institutional Arrangements

The PIU has overall responsibility for assessing the project’s performance in achieving the PDO and intermediate outcome indicators. The PIU is also responsible for further developing and maintaining the already developed Project Management Information System (PMIS). The PMIS that is in place provides a platform for entering data on all monitoring and evaluation aspects of the project, including physical progress, project outputs, financial disbursements, and procurement data. The PMIS will need to be made

accessible to designated officials in the Irrigation Department and GDP to enable these supervising units directly obtain monitoring reports.

The PIU has engaged an external M&E agency who is primarily be responsible to collect data for assessing the impact of the project on selected outcome indicators. Towards this effort, the M&E agency has developed a sound survey strategy and sampling methodology that forms the foundation for impact assessment. Two surveys will be conducted by the M&E agency; (i) baseline survey to capture the indicators before project implementation in both target and control schemes, and (ii) impact assessment survey at completion of the project. The surveys are conducted on a consistent sample of households.

The PIU has also assumed responsibility for internal monitoring to track physical progress of project processes and outputs. To ensure effective performance of this function, the unit is adequately staffed with a senior M&E expert and supporting staff to help in the following: (i) designing data collection forms to record various project processes e.g. election of IAs officials, irrigation roster in each scheme, approval of designs for irrigation physical infrastructure, completion of works; (ii) entering data collected using such formats; (iii) preparing monitoring reports; (iv) supporting the M&E agency in survey work; and (iv) documentation. The M&E staff in the PIU in the Kabul head office, in close cooperation with the Area Teams, is functioning adequately ensuring that: (a) in each monitoring phase, the data collection formats and surveys capture relevant aspects of the project, including project processes and physical outputs; (b) data is collected in a timely manner and properly entered in the systems; and (c) reports of appropriate contents and quality are generated in a timely manner.

#### Data Validation and Entry

The PIU has developed a process that ensures that data collected through the project is entered into the PMIS. The responsibility for data quality lays with respective data collection units, including the external M&E agency, but PIU will provide oversight during the entire data collection exercise, including visiting the project area to undertake field-level verification of data already collected. In particular, the external M&E agency is responsible for designing a series of codes or processes for conducting checks on formats/questionnaires during data collection and cleaning the data after entry. After all checks have been conducted, the data are transferred to the PMIS.

#### Capacity Building and Learning

The external M&E agency provides support to all implementing agencies during internal monitoring processes, especially designing data collection formats and the actual process of gathering data on activities and physical outputs.

The PIU coordinates training on use of PMIS to key project staff, the Irrigation department, and implementing agencies. The training includes generating standard reports from the system. In addition, the PIU will coordinate seminars to disseminate monitoring and evaluation results and project learning notes.

#### Data Analysis and Reporting of Results Monitoring and Evaluation

The PMIS already in place includes a reporting function to generate simple, informative, and user-friendly reports. The following reports form the backbone of results monitoring: (i) basic scheme level monthly reports on the status of implementation activities, findings of participatory monitoring processes, and progress on capacity building activities; (ii) bi-annual consolidated reports; (iii) baseline report, (iv) mid-term review; and (v) final impact assessment report at project completion.

The key characteristics common to monthly, bi-annual, and mid-term review reports are: (i) they describe the status of the project in terms of implementation activities and progress towards achieving the expected outputs and outcomes, (ii) they identify the factors which delay implementation activities or prevent the achievement of outputs and outcomes, and (iii) they identify corrective actions and summarize lessons learnt.

Table A1.2 below describes the various arrangements for results monitoring in greater detail.

**Table A.1.2 Arrangements for Results Monitoring**

Project outcome indicators	Baseline	Target Values (%)			Data Collection and Reporting		
		YR 1	YR 2	YR 3	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
<ul style="list-style-type: none"> <li>Increase in land productivity of wheat<sup>2</sup> (kgs/ha) in project areas</li> </ul>	2.5	-	10%	15%	Baseline, MTR and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
<ul style="list-style-type: none"> <li>Increase of water productivity of wheat<sup>3</sup> (kgs/cubic metre) in project areas</li> </ul>	0.625	-	10%	15%	Baseline, MTR and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
<ul style="list-style-type: none"> <li>Increased irrigated area (ha) due to project interventions</li> </ul>	0	-	5%	10%	Baseline, MTR and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
Intermediate outcome indicators	Baseline	YR 1	YR 2	YR 3	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
<p><b><u>Component A:</u></b></p> <p><b>Sub-component A1: Establishment and Strengthening of Irrigation Associations (IA)</b></p> <ul style="list-style-type: none"> <li>Number of IAs formed and registered</li> <li>Number of training sessions</li> </ul>	0	50	100	175	Monthly	M&E field visits using forms	PIU M&E staff  PIU M&E staff

<sup>2</sup> To be done for other crops as well

<sup>3</sup> To be done for other crops as well

Project outcome indicators	Baseline	Target Values (%)			Data Collection and Reporting		
		YR 1	YR 2	YR 3	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
provided to each IA each year including contents of such sessions	0	1	1	1		M&E field visits using forms	
<b>Sub-component A2: Improvement of on-farm physical irrigation infrastructure</b>							
<ul style="list-style-type: none"> <li>Associated command area covered (cumulative)</li> </ul>	0	0	3000	10000	Baseline and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
<ul style="list-style-type: none"> <li>Conveyance efficiency % (litres/second at the tail end field divided by litres/second upstream where works begin)<sup>4</sup></li> </ul>	40%	-	60%	60%	Baseline and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
<ul style="list-style-type: none"> <li>Decrease in conveyance duration<sup>5</sup> (%)</li> </ul>	0%	-	40%	40%	Baseline and ICR reports	Baseline and end-of-project survey	M&E agency and PIU
<ul style="list-style-type: none"> <li>Decrease in time to divert water to farmer's field (%)</li> </ul>	0%	-	70%	70%	Baseline and ICR reports	Baseline and end-of project survey	M&E agency and PIU
<b>Sub-component A3: Dissemination of improved water saving measures through</b>							

<sup>4</sup> Get a measure in three points (head, middle, and tail) for every scheme just before works begin and end-of-project survey – coordinates of measurement locations for each scheme must be recorded

<sup>5</sup> Every farmer in the sample will be asked (during baseline and end-of-project surveys) for the time it takes for water to reach his farm once it is connected for his turn.

Project outcome indicators	Baseline	Target Values (%)			Data Collection and Reporting		
		YR 1	YR 2	YR 3	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
<b>irrigation demonstration sites</b>	0	1	9	15	Monthly	M&E field visits using forms	PIU M&E staff
• Number of irrigation demonstration sites	0	3	30	75	Monthly	M&E field visits using forms	PIU M&E staff
• Number and type of water-saving measures demonstrated	0	100	400	1000	Monthly	M&E field visits using forms	PIU M&E staff
• Number of farmers participating in demonstrations	0	10	40	100	Monthly	M&E field visits using forms	PIU M&E staff
• Number of farmers adopting the demonstrated measures							
<b>Component B: MAIL Institutional Strengthening and Capacity Building</b>							
• Number of MAIL, DAIL and OFWMP persons trained at various institutions	0	30	50	95	Quarterly	M&E records	PIU M&E staff
• Proportion of rehabilitated schemes obtaining at least “satisfactory” rating from irrigation water users	0	50%	60%	70%	Monthly (MTR and ICR reports)	M&E field visits using forms; (MTR and end-of project survey)	PIU M&E staff (incl. M&E agency)