



<b>1. Project Data:</b>		<b>Date Posted :</b> 04/17/2002	
<b>PROJ ID:</b> P008277		<b>Appraisal</b>	<b>Actual</b>
<b>Project Name:</b> Irrigation Rehabilitation	<b>Project Costs (US\$M)</b>	57.15	51.86
<b>Country:</b> Armenia	<b>Loan/Credit (US\$M)</b>	43.00	40.55
<b>Sector(s):</b> Board: RDV - Irrigation and drainage (75%), Central government administration (18%), Water supply (5%), Other social services (2%)	<b>Cofinancing (US\$M)</b>	8.00	7.80
<b>L/C Number:</b> C2667; CP876			
	<b>Board Approval (FY)</b>		95
<b>Partners involved :</b> IFAD	<b>Closing Date</b>	06/30/1999	05/31/2001
<b>Prepared by :</b>	<b>Reviewed by :</b>	<b>Group Manager :</b>	<b>Group:</b>
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<b>2. Project Objectives and Components</b>			
<b>a. Objectives</b>			
To assist Armenia in maintaining the level of irrigated agricultural production, and to improve the country's water resources management. According to the ICR this objective was later enlarged to include "...and accelerate the development of water distribution institutions and support facilities needed for a market -based privatized agriculture." The DCA, however, was not amended.			
<b>b. Components</b>			
There were four:			
<ol style="list-style-type: none"> <li>1. rehabilitation of 12 irrigation schemes and the Ararat groundwater network covering 165,000 ha and including rehabilitation of 2,077 km of canals and 500 km of pipelines (US\$36.18 million);</li> <li>2. establishment of pilot projects for water distribution and new Water Users' Consumer Cooperatives (WUCCs) covering 25,000 ha (US\$2.47 million);</li> <li>3. financing for incremental operation and maintenance (O&amp;M) costs on a declining basis (US\$5.0 million) and the imposition of water charges so that 100% of O&amp;M costs are covered by project closure;</li> <li>4. Establish a project implementation unit and provide TA assistance to update the water master plan, training, and improve productivity of irrigated crops (US\$2.56 million).</li> </ol>			
Underestimation of costs at appraisal (described below) required a reassessment that postponed lower priority pilot works of component 2 to a second phase and increased the budget allocated to rehabilitation under component 1.			
<b>c. Comments on Project Cost, Financing and Dates</b>			
In 1995-96, following a Bank reconfiguration mission, the scope of rehabilitation was confined to only the highest priority works covering 148,000 ha because it was found that the actual cost of the SAR civil works proposed were twice that budgeted (\$66 million vs \$32 million at appraisal). This cost escalation was due to three factors . First, the extent of irrigation system deterioration was far greater than estimated at appraisal; second, unit costs increased far beyond the price contingency of 20% to near-international levels compared those prevailing when Armenia was part of the former Soviet Union (FSU) and used for appraisal at government's insistence; and third, the lack of private sector contractors reduced competition and led to higher bids for civil works . Within the constraint of the original budget, expenditures were reprioritized to focus on the civil works program . Thus there was a substantial reduction in the disbursement on goods (from \$34.7 million to \$2.67 million) and a tripling on the amount (from \$13.1 million to \$37.8 million) spent on civil works: primarily main, secondary and tertiary canals; rehabilitation of dams and improved water management. As a result of additional work required to prioritize locations for civil work reconstruction after the project was reconfigured, project closing was extended by two years .			
<b>3. Achievement of Relevant Objectives:</b>			
The original and revised objectives were substantially achieved with some shortcomings :			
<ul style="list-style-type: none"> <li>• Rehabilitation guaranteed the integrity of a major portion of Armenia's irrigation system thus allowing continued operation with increased efficiency - this is particularly important as 80% of current national agricultural production is based on irrigation;</li> </ul>			

- Government adopted an Irrigation Sector Program (April 2001) in which it promulgates full decentralization, participatory management, full cost recovery by 2006 and steady increases in water tariffs to match costs;
- There was substantial capacity building to meet the transition to a market-based economy. Ministry of Agriculture agencies dealing with irrigation have fully adopted rigorous economic analysis to examine trade-offs to aid selection and sequencing of works for system maintenance. The Project Implementation Unit has become a recognized center of excellence and is proactive in future planning and coordination of the irrigation sector. Participatory management of irrigation schemes by beneficiaries was implemented by government (a first in FSU countries), as were differential water tariffs reflecting varying costs of supply. A viable and competitive private sector contracting capability has become established.

#### 4. Significant Outcomes/Impacts:

- Irrigation to 146,800 ha was sustained (or 89% of the original target and 99% of the revised target). As part of this effort 645 km of canals, 11 pumping stations, 238 tubewells and 4 dams were rehabilitate and made fully operational;
- Water losses were reduced, delivery efficiency increased and drainage canals rehabilitated (310 km), thus reducing costs and producing positive environmental benefits (reduced waterlogging), particularly in the Ararat valley;
- WUCC were introduced and established over 27,800 ha (111% of target);
- Growth of private sector civil engineering contractors, allied with capacity and skill improvements in the line agency (which improved cost estimation and the specification process) led to savings which enabled project funds to be used for electronic water measurement devices (2,145 units) in the main, secondary and tertiary canals, and two-tariff water electric meters (672) for pumps - this underpinned water/electricity charges with a rational basis and transparency;
- The ex-post economic rate of return was estimated to be 29%; and
- O&M cost recovery of 36% was achieved.

#### 5. Significant Shortcomings (including non-compliance with safeguard policies):

- Appraisal was defective. It underestimated the true scope of rehabilitation needed and was ineffective in persuading government to adopt border prices for construction materials. As a result, potential cost overruns caused project realignment. In addition, more attention should have been given to institutional reform;
- Ministry of Agriculture use of the fund for incremental O&M was *ad hoc* rather than based on strategic priorities thus lessening its effectiveness. Other development partners state more systemic reform of O&M and participation of beneficiaries could have made it more efficient and reduced costs;
- The failure to reach the unrealistic 100% O&M cost recovery target is more a shortcoming of the Bank than the borrower - the Bank should have know from its global experience that, given the substantial institutional changes needed from a zero base, that this could not be achieved in only six years. Politicising the water charge as part of the Presidential elections and reducing water charges in 1998 did not help either. Another reason for low water charge recovery rates was the way in which water charges were initially calculated (by land area) was a disincentive- and this was only overcome once the Bank and government agreed to meter water delivered after 1999. Considerable work is needed to establish the real cost of water and identify areas where costs savings (e.g. energy use for high lift pumping) could be made;
- WUCCs are still very weak and require considerable institutional support and training to become fully effective at taking over the O&M tasks.
- The absence of a rural credit component for middle and poor farmers constrained the profitability of farming operations.

6. Ratings:	ICR	OED Review	Reason for Disagreement /Comments
<b>Outcome:</b>	Satisfactory	Satisfactory	
<b>Institutional Dev.:</b>	Substantial	Substantial	
<b>Sustainability:</b>	Highly Likely	Likely	WUCCs need capacity building; O&M needs more reform.
<b>Bank Performance:</b>	Satisfactory	Satisfactory	unsatisfactory appraisal was balanced by excellent supervision.
<b>Borrower Perf.:</b>	Satisfactory	Satisfactory	
<b>Quality of ICR:</b>		Satisfactory	

NOTE: ICR rating values flagged with '\*' don't comply with OP/BP 13.55, but are listed for completeness.

#### 7. Lessons of Broad Applicability:

- Using pricing systems inherited from the FSN system guarantees significant implementation problems - in NIS it is imperative that international pricing is used for cost estimates;
- Where the operational challenge is triage, it is as important to devote resources to reorientating and building institutional capacity as it is to repairing the physical infrastructure;

- In NIS, rural credit and assistance to develop markets are as essential as infrastructure rehabilitation to safeguard the weaker sections of the farming community .
- Extra supervision is helpful for new borrowers . It helps the speedy identification of teething problems, and facilitates project restructuring if problems emerge .

**8. Assessment Recommended?** ☒ Yes ☐ No

**Why?** Armenia is a forthcoming CAE country and irrigated agriculture (involving several other development partners, some jointly with the Bank ) is a vital part of the economy . Given the substantial problems post-appraisal, it would be instructive to examine the factors that eventually led to the apprenatly successful outcome.

**9. Comments on Quality of ICR:**

Somewhat thin in describing achievements of the water resources management and training aspects .