



Completion Report

Project Number: 33042-013
Loan Number: 2124-TAJ(SF)
November 2012

Tajikistan: Irrigation Rehabilitation Project

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – somoni (TJS)

		At Appraisal (31 October 2004)	At Project Completion (23 August 2011)
TJS1.00	=	\$0.3351	\$0.2104
\$1.00	=	TJS2.9839	TJS4.7522

ABBREVIATIONS

ADB	–	Asian Development Bank
CPS	–	country partnership strategy
CSP	–	country strategy and program
CRFS	–	cost recovery and fee structure
DMF	–	design and monitoring framework
EA	–	executing agency
EIRR	–	economic internal rate of return
I&D	–	irrigation and drainage
M&E	–	monitoring and evaluation
MWRLR	–	Ministry of Water Resources and Land Reclamation
NGO	–	nongovernment organization
NPV	–	net present value
O&M	–	operation and maintenance
PMO	–	project management office
PSC	–	project steering committee
SDR	–	special drawing rights
TA	–	technical assistance
TAAS	–	Tajikistan Academy of Agricultural Sciences
WUA	–	water users association
WUASU	–	Water Users Association Support Unit

WEIGHTS AND MEASURES

ha	–	hectare
km	–	kilometer
t	–	metric ton

NOTES

- (i) The fiscal year (FY) of the Government of Tajikistan and its agencies ends on 31 December.
- (ii) In this report, “\$” refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country:	Tajikistan
2.	Loan Number	2124(SF)
3.	Project Title	Irrigation Rehabilitation Project
4.	Borrower	Republic of Tajikistan
5.	Executing Agency	Ministry of Water Resources and Land Reclamation
6.	Amount of Loan	SDR15,146,000
7.	Project Completion Report Number	1373

B. Loan Data

1.	Appraisal	
	– Date Started	6 September 2004
	– Date Completed	16 September 2004
2.	Loan Negotiations	
	– Date Started	10 November 2004
	– Date Completed	12 November 2004
3.	Date of Board Approval	10 December 2004
4.	Date of Loan Agreement	25 May 2005
5.	Date of Loan Effectiveness	
	– In Loan Agreement	23 August 2005
	– Actual	6 September 2005
	– Number of Extensions	1
6.	Closing Date	
	– In Loan Agreement	30 June 2011
	– Actual	23 August 2011
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	1% per annum during the grace period and 1.5% per annum thereafter
	– Maturity (number of years)	32
	– Grace Period (number of years)	8

8. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
29 November 2005	15 August 2011	69.5 months
Effective Date	Original Closing Date	Time Interval
6 September 2005	30 June 2011	70.8 months

b. Amount (SDR '000)

Category or Subloan	Original Allocation	Revised Allocation	Last Revised Allocation	Amount Canceled	Amount Disbursed
01 Civil works	2,437	5,198	5,178	(20)	5,178
02A Equipment	9,126	7,301	7,245	(56)	7,245
02B Vehicles	50	115	115	0	115
02C Materials	206	11	7	(4)	7
03 Training Extension & Studies	783	225	240	15	240
04 Consulting Services	1,424	0	0	0	0
04A Consulting Service – Foreign	0	1,742	1,738	(4)	1,738
04B Consulting Services – Local	0	14	27	13	27
05 Office & Staff Cost	164	83	82	(1)	82
06 Interest Charge	457	457	397	(60)	397
07 Unallocated	499	0	0	0	0
Total SDR	15,146	15,146	15,029	117	15,029
Total US\$ ('000)	22,700	22,700	23,241	188	23,241

() = negative.

9. Local Costs (Financed)	
- Amount (\$ million)	7.10
- Percent of Local Costs	56.66
- Percent of Total Cost	24.74

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	13.27	16.15
Local Currency Cost	15.74	12.52
Total	29.01	28.67

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	6.29	5.43
ADB Financed	22.04	22.63
Other External Financing		
Subtotal	28.33	28.05
IDC Costs		
Borrower Financed		
ADB Financed	0.69	0.62
Other External Financing		
Total	29.01	28.67

ADB = Asian Development Bank, IDC = interest during construction.

Totals may not be exact due to rounding.

3. Cost Breakdown by Project Component (\$ million)

Component	Appraisal Estimate	Actual
A. Base Cost		
1. Rehabilitation of I&D Infrastructure	21.43	21.54
2. Improvement of Water Supply Systems	2.45	2.31
3. Agricultural Support to Farmers	0.87	0.22
4. Project Management	3.30	3.84
Subtotal	28.04	27.91
B. Contingencies ^a		
1. Physical Contingencies	1.01	
2. Price Contingencies	(0.73)	0.03
3. Exchange difference cost		0.11
Subtotal	0.29	0.15
C. Interest Charges	0.69	0.62
Total	29.01	28.67

^a Government actual costs included contingency allowances.
Totals may not be exact due to rounding.

4. Project Schedule

Item	Appraisal Estimate ^a	Actual
(i) Date of Contract with Consultant		6 September 2006
Date of Completion		
(ii) Civil Works Contract		
(a) Repair of PMU Office		
Date of Award		16 September 2005
Completion of Work		January 2006
(b) Repair of Regional Offices		
Asht district:		
Date of Award		17 May 2006
Completion of Work		August 2006
Farkhor district:		
Date of Award		12 May 2006
Completion of Work		June 2006
Rushan district:		
Date of Award		17 May 2006
Completion of Work		August 2006
Pyanj district:		
Date of Award		12 May 2006
Completion of Work		July 2006
(c) Asht district civil works		
Date of First Award	September 2006	27 November 2007
Completion of Works	July 2009	6 September 2010
(d) Farkhor district civil works		
Date of First Award	June 2007	19 November 2007
Completion of Works	July 2009	7 October 2010

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(e) Hamadoni district civil works		
Date of First Award		16 February 2007
Completion of Works		1 September 2008
(f) Pyanj district civil works		
Date of First Award	September 2007	22 March 2007
Completion of Works	August 2009	15 June 2011
(g) Rushan district civil works		
Date of First Award	June 2006	18 January 2008
Completion of Works	September 2009	10 June 2010
(h) Vahdat district civil works		
Date of First Award	September 2006	19 November 2007
Completion of Works	October 2009	28 September 2010
(iii) Equipment and Supplies Dates		
First Procurement	September 2006	January 2008
Last Procurement	December 2008	August 2010
(iv) Other Milestones		
Minor change in scope		6 February 2006
Minor change in scope and implementation arrangements		18 June 2007
Minor change in scope and implementation arrangements		22 June 2007
Reallocation of Loan proceeds:		
(a) First		22 November 2006
(b) Second		15 July 2010

^a Blank indicates no contract was specified at appraisal.

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From January 2005 to December 2007	Satisfactory	Satisfactory
From January 2008 to December 2008	Highly Satisfactory	Highly Satisfactory
From January 2009 to December 2009	Satisfactory	Highly Satisfactory
From January 2010 to December 2010	Satisfactory	Satisfactory
From January 2011 to August 2011 ^a	On Track	

^a In 2011, e-Ops replaced the project performance rating. The indicators used in performance rating are (i) Technical, (ii) Procurement, (iii) Disbursement, (iv) Financial Management, and (v) Safeguards.

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
Loan Fact Finding	28 June–16 July 2004	1	19	a
Appraisal Mission	6–16 September 2004	4	44	a, b, c, d
Inception Mission	6–26 November 2005	2	26	a, e
Review Mission 1	22–29 November 2006	1	8	f
Review Mission 2	13–25 April 2007	3	24	f, g, h
Midterm Review	1–7 May 2008	2	14	i, j
Review Mission 3	26 October–3 November 2009	2	18	j, k
Review Mission 4	26–28 July 2010	2	6	j, l
Review Mission 5	14–16 November 2011	1	3	j
Project Completion Review	18 June–1 July 2012	4	52	j, m, n, o

a = water resources specialist, b = project economist (staff consultant), c = project officer, d = counsel, e = associate project analyst, f = sr. natural resources management specialist, g = project analyst, h = sr. financing partnership specialist, i = PAU head, j = water resources specialist, k = associate operations analyst, l = integrated water resources management specialist, m = natural resources and agriculture economist, n = associate project officer, o = economist (staff consultant).

I. PROJECT DESCRIPTION

1. Tajikistan is a highly agrarian country: 74% of the population lives in rural areas, with 67% working in agriculture.¹ The agriculture sector is important to Tajikistan's economy, contributing 20% of gross domestic product in 2008 (down from 37% in 1995).² Cotton fiber is the leading agricultural commodity exported (contributing 16% of all exports), second only to aluminum (which accounts for 60%).

2. Agricultural productivity has declined significantly since the country attained its independence from the former Soviet Union in 1991. Cotton and grains (mostly wheat) are the major crops, accounting for 29% and 45% of sown area. Cotton production declined from 842,000 tons in 1990 to 353,000 tons in 2008, while yields experienced a dramatic decline from 2.77 to 1.56 tons per hectare.³ Although the yields of grain crops remain low, they improved from 1.37 tons per hectare in 1990 to 2.09 tons per hectare in 2008.

3. Throughout the 1990s, irrigated agriculture suffered from the combined effects of (i) a loss of traditional markets following independence (for example, in horticulture); (ii) deterioration in irrigation and drainage (I&D) infrastructure; and (iii) the socioeconomic impact of a debilitating civil war. The poor condition of I&D infrastructure resulted in excessive water losses, waterlogging, soil salinization, and declining crop yields. At the time of project design, an estimated 16% of formerly irrigated land had been out of production since 1991.⁴ Inadequate funding and maintenance of I&D infrastructure had caused rapid deterioration in the capacity of pumping stations, increased water losses in the main canals, and low water-use efficiency in fields.

4. At appraisal, the stated project goal (impact) was to improve the living standards of the rural population in the project areas. The project had two purposes (outcomes): increased agricultural productivity and improved access to rural potable water systems. In 2011, the design and monitoring framework (DMF) of the project was retrofitted and the purpose was restated into the outcome statement: "agricultural productivity, incomes, and access to potable water supply systems for rural commodities are improved."⁵ The project outputs were restated as follows: (i) selected I&D systems are rehabilitated, and improved operations and maintenance (O&M) is in place; (ii) improved potable drinking-water supply systems are available in the selected project areas; (iii) farmers have adopted improved agricultural technologies; and (iv) agricultural policy and market reforms are operational. As designed, the project was to partially rehabilitate infrastructure for irrigation systems in five districts across Tajikistan: Farkhor, Pyanj, Rushan, Asht, and Vahdat. The project was approved on 10 December 2004 for SDR15.1 million (\$22.7 million equivalent).

¹ Statistical Agency under President of the Republic of Tajikistan: Employment by sector of economy, 1985–2008 (<http://www.stat.tj/english/tables.htm>).

² Statistical Agency under President of the Republic of Tajikistan: Nominal GDP by branches of origin, 1995–2008 (<http://www.stat.tj/english/tables.htm>).

³ Statistical Agency under President of the Republic of Tajikistan: Production and yields of major agricultural crops 1985–2008 (<http://www.stat.tj/english/tables.htm>).

⁴ ADB. 2004. *Report and Recommendation to the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Republic of Tajikistan for the Irrigation Rehabilitation Project*. Manila.

⁵ ADB. 2011. "Good Project Implementation Practice: Retrofitting Ongoing Projects Financed by Loans and Grants into eOperations." Memorandum. Central Operations Services Office. Manila. February.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

5. The project design was consistent with Tajikistan's Poverty Reduction Strategy at the time of appraisal, specifically the need for land reform in agriculture and rehabilitation of irrigation infrastructure.⁶ The project was consistent with the National Development Strategy for 2007 to 2015, which aimed to provide for an orderly long-term development process in accordance with the Millennium Development Goals.⁷ The National Development Strategy is organized in three blocks, defined by their role and place in the achievement of Tajikistan's strategic goals: (i) the "functional block," which provides for the appropriate institutional and functional environment for development; (ii) the "production block," which is responsible for the physical environment to support economic growth; and (iii) the "social block," which provides for expansion of access to basic social services and the resolution of social development issues.

6. One specific problem identified in the production block was the limitation on opportunities for agriculture caused by the physical state of irrigation infrastructure, which contributes to low food security, and low availability and affordability of high-quality foodstuffs. Rebuilding and developing irrigation systems were identified as key activities needed to achieve the production block priority of raising the productivity of agricultural operations. The Water Sector and Development Strategy of Tajikistan stated that rehabilitation of irrigation systems was a key goal to bring agricultural production back to the pre-1990 level.⁸

7. The project was consistent with ADB's country strategy and program (CSP) at the time of formulation. The CSP stated that agricultural productivity was low and could be raised by (i) structural reforms that increase incentives for farmers to produce, and (ii) investment in rural infrastructure that had been destroyed by civil war and years of neglect.⁹ To improve economic growth, the CSP focused on two areas: rural development and regional cooperation. To improve rural development, it identified three activities: (i) creating a better environment for more inclusive growth; (ii) improving productivity and profitability in the rural sector through institution building that strengthens policy implementation and encourages private sector activities; and (iii) improving irrigation and transport infrastructure. The project was specifically identified in the portfolio pipeline of the CSP. The CSP update issued in September 2004 stated that ADB would continue its support for four efforts: (i) rehabilitation of I&D facilities; (ii) improvements in rural potable-water supply; (iii) establishment of community-based organizations; and (iv) improvements in agricultural support services and financing.¹⁰

8. The Country Partnership Strategy (CPS) 2010–2014 identified three key sectors for investment: energy, transport, and private sector development and public services.¹¹ Although agriculture was considered an important sector in Tajikistan, the CPS stated that ADB would withdraw support from agriculture because (i) ADB should be selective and focus the use of Asian Development Fund resources in a few areas, and (ii) the World Bank would continue to invest in agriculture in Tajikistan. According to the CPS, ADB would focus on infrastructure investment, with rehabilitation of irrigation systems and private sector development.

⁶ Republic of Tajikistan. 2002. *Poverty Reduction Strategy Paper*. Dushanbe.

⁷ Republic of Tajikistan. 2007. *National Development Strategy of the Republic of Tajikistan for the period to 2015*. Dushanbe.

⁸ Republic of Tajikistan. *Water Sector Development Strategy of Tajikistan*. 2006. Dushanbe.

⁹ ADB. 2003. *Country Strategy and Program (2004–2008): Tajikistan*. Manila.

¹⁰ ADB. 2004. *Country Strategy and Program Update (2005–2006): Tajikistan*. Manila.

¹¹ ADB. 2010. *Country Partnership Strategy (2010–2014): Tajikistan*. Manila.

9. The formulation process included project preparatory technical assistance, which guided the project design. That assistance was well detailed and thorough in terms of addressing the key development issues and preparing the engineering design.

B. Project Outputs

10. The project had four outputs, entailing a mix of physical rehabilitation works, institutional capacity building, agricultural productivity improvement, and policy reform. Project output achievements and indicators are compared with the retrofitted DMF in Appendix 1.

1. Selected I&D Systems Rehabilitated and Improved O&M

11. This output was to rehabilitate infrastructure in each project area. In Asht district, the Asht-1 irrigation system was to be upgraded by (i) improving intake and sediment removal facilities; (ii) rehabilitating pumping stations ANS-1, ANS-2, and ANS-3B; (iii) providing gravity-fed irrigation supply to upper system levels; and (iv) renovating canal lining structures and restoring drain capacities.

12. In Farkhor district, the focus was on improving sediment and water control and rehabilitating the Urtaboz pumping system. This work included (i) improving the Chebek headworks, constructing a new sediment removal facility, and providing sediment removal equipment; (ii) repairing key control structures and restoring the hydraulic performance of key canals and drains; and (iii) rehabilitating prioritized Urtaboz pumping stations.

13. In Pyanj district, the rehabilitation work comprised (i) improvement of intakes; (ii) rehabilitation of sediment removal facilities and provision of sediment removal equipment; (iii) repair of key control structures; (iv) improvement of the hydraulic efficiency of canal and drain sections; and (v) rehabilitation of prioritized Fayazabadkala pumping stations.

14. In Rushan district, the project works covered the following repairs to small systems: (i) rehabilitation of intake works and removal of large rocks from canals; (ii) selective repair of control structures and canal linings; and (iii) restoration of main drains capacity.

15. In Vahdat district, the project (i) rehabilitated the headworks of the Dashtibed canal and provided a weir¹² across the Kofarnihin river; and (ii) repaired selected structures in both the Rohati and Dashtibed irrigation systems.

16. To improve water resources management, the project intended to facilitate the establishment of water user associations (WUAs) across the project sites. The WUAs were expected to raise levies and improve O&M, as well as strengthen rural water sector institutions.

17. Following extreme flood damage in June 2005, the Government of Tajikistan asked ADB in August to provide support to rehabilitate the Dehkanobod canal and bank protection structures along the Pyanj river in Hamadoni district. Agreement was reached in September 2006 to provide \$3.3 million from the project to rehabilitate flood-damaged infrastructure by reducing the scale of civil works in Asht (removal of the rehabilitation of the Asht-2 cascade pump) and Farkhor (reduction in number of sediment removal facilities constructed). The Hamadoni works included (i) strengthening a 4.2-km section of existing flood embankment; (ii) constructing 15 new bank protection spurs; and (iii) constructing the Chubek intake canal.

¹² A weir is a barrier across a river that causes water to pool behind the structure.

18. ADB received separate project-related complaints from two nongovernment organizations (NGOs). In March 2009 a NGO alleged that in Vahdat (i) no progress had been made in rehabilitating the headworks of the Dashtibed canal, (ii) there was potential for private ownership and control of irrigation water, and (iii) the rehabilitation works of Dashtibed canal had been delayed. Following a joint mission by ADB and project staff, the NGO was satisfied that the government controlled both land and water resources and that the rehabilitation works would be completed on schedule.

19. In September 2011, a NGO raised concerns about the rehabilitation of the irrigation system in Asht. These concerns related to detailed design (16 items) and water management (3 items). A desk review by ADB and project staff, and an independent field spot review by ADB found that three of the design concerns and two of the water management concerns were valid. In response, the government committed to complete the physical works that provoked the concerns by the end of 2013.¹³ The reviews found that the invalid concerns arose from a misunderstanding by the NGO, which was that the irrigation system would be fully rehabilitated instead of partly rehabilitated.

20. Overall, the project output was achieved, with successful implementation of the capital works activities. Although the WUAs, support units, and fee structures were established as required, there were ongoing problems related to performance and sustainability.

21. Delays in physical infrastructure rehabilitation activities resulted from the expansion of the scope to include the emergency rehabilitation works in Hamadoni. All contracts in Farkhor (two for equipment; six for civil works), Pyanj (one for equipment; four for civil works), Rushan (two for civil works), Asht (four for equipment; four for civil works) and Vahdat (three for civil works) were completed. Details of the contracts, including start and completion dates, appear in Appendix 2. Seven irrigation systems were partly rehabilitated, and four drainage systems were cleaned. Twelve headworks and intake structures (target nine) and 13 pumping stations (target nine) were rehabilitated.¹⁴

22. During project implementation, two minor changes in scope were approved. In February 2007, Hamadoni rehabilitation works were added, and the construction of sediment removal facilities in Farkhor and the rehabilitation of pumping station ANS-2D in Asht were withdrawn from the project. In May 2009, the rehabilitation of ANS-2D was reinstated and the replacement of pipelines in pumping stations ANS-2D and ANS-3B in Asht was withdrawn.

23. A water users association support unit (WUASU) was established in May 2007 under Ministerial Order No. 128. The WUASU has a three-tier structure with central, provincial, and district offices. The WUASU assists in the creation and capacity development of WUAs by preparing materials and undertaking training programs for WUA members. It employs 13 staff, of which 2 are women (15%). The staffing is less than designed because of funding limitations.

¹³ One of the valid complaints in category (ii) addressed the malfunction of WUAs caused by limited project support. Although the WUAs began operations in 2007 and received training since then, further support and more time is required before they can be considered fully functional because WUAs are a relatively new concept in Tajikistan. The remaining valid complaint concerned the lack of participation by beneficiaries in project design, implementation, and monitoring. The main public participation has occurred through WUAs during project implementation, yet the WUAs are not sufficiently functional to provide adequate community feedback.

¹⁴ Three headworks and intake structures, and two pump stations were added to the I&D systems rehabilitated in Rushan.

24. Twenty-five WUAs have been established: 7 in Farkhor, 5 in Pyanj, 2 in Rushan, 6 in Asht, and 5 in Vahdat. Most WUAs have a chairman, an accountant, a hydrologist, a water service fee collector, and O&M staff. In the project areas there are 18,490 WUA members (39% are women) (Appendix 3).

25. The project provided training to WUA staff and members on topics including (i) accounting and budget preparation, (ii) payment of water and service fees, (iii) measurement of crop water requirements, and (iv) water distribution techniques. Training certificates were awarded to 1,500 farmers and WUA staff.

26. An O&M cost recovery mechanism was established. In June 2007, the Ministry of Economic Development and Trade issued Decree No. 10 establishing a water supply service fee of 0.78 dirams per m³ for gravity-fed irrigation schemes and 1.25 dirams per m³ for pump irrigation schemes.¹⁵ In May 2008, to improve O&M cost recovery, the rates were revised to 1.50 dirams per m³ for gravity irrigation schemes and 2.39 dirams per m³ for pump irrigation schemes. In practice, this differential pricing is not applied. The collection rates for irrigation service fees by WUAs vary between 30% and 80%.

2. Improved Potable Drinking Water Supply Systems

27. The purpose of this output was to support reconstruction of five potable-water supply systems in the project areas. This required (i) the provision of pumps and generators, as well as repairs to reservoirs and distribution pipework in Farkhor; (ii) construction of wells, reservoirs, pumping stations, pipelines, and a distribution network in Pyanj; (iii) construction of an intake, a storage reservoir, and distribution pipework in Rushan; (iv) construction of intakes, a reservoir, distribution pipework, and standpipes in Asht; and (v) construction of wells, and repairs to reservoirs and distribution network in Vahdat. Overall, the output was partly achieved.

28. Potable water supply systems were constructed in one village in Asht (completed in September 2010), two villages in Farkhor (completed in September 2010), one village in Pyanj (completed in June 2011), one village in Rushan (completed in June 2010), and seven villages in Vahdat (completed in September 2010). Construction activities in Pyanj were delayed by the relocation of the target village (Somon settlement) to a new site following flood damage to the original site in 2009.

29. The new potable water supply systems benefited 31,620 people: 5,020 in Asht (965 households); 5,200 in Farkhor (510 households); 600 in Pyanj (63 households); 5,800 in Rushan (840 households); and 15,000 in Vahdat (1,470 households). This was less than the target beneficiary population of 57,000 for two reasons: (i) at project completion, approximately 700 households (approximately 5,880 people) were under construction at a relocated village in Asht and had yet to benefit from the system, and (ii) in a target village in Pyanj a number of households (approximately 11,700 people) had to relocate from the initial coverage area because of flood damage.

30. By October 2009, rural water supply committees had been established in each district with support from the MWRLR. At a minimum, each committee has a chairman, an accountant, a pump operator, an electrician, and a water service fee collector. The committees employed 37 people, of which 8 (22%) were women (Appendix 3). The staffing levels were as follows: 9 in Asht; 12 in Farkhor; 5 in Pyanj; 6 in Rushan; and 5 in Vahdat. Not all of the committees are fully

¹⁵ 100 dirams = TJS1.

functional. Problems include high staff turnovers, poor delivery owing to the inability to operate pumps because of electricity shortages, and low fee collection rates.

31. Sustainable O&M was partly implemented. In each district, the rural water supply committee established a cost recovery and fee structure (CRFS). The CRFS is based on an estimate of the O&M cost and the level of affordability by the community, and then submitted to the Antimonopoly Committee for approval. The CRFS differs in each district, as follows: Asht, 30 dirams per m³ (90% collection rate); Farkhor, TJS1 per person per month (95% collection rate); Pyanj, TJS3 per person per month (95% collection rate); Rushan, 40 dirams per m³ (98% collection rate); and Vahdat, TJS10 per household per month (70% collection rate). Fees were collected by the rural water supply committees. Although a fee collection system has been implemented and committees collect fees, in all districts they have problems collecting sufficient funds to cover the full costs of O&M.

3. Farmers Adoption of Improved Agricultural Technologies

32. The purpose of this output was to address deficiencies in the provision of quality seeds and in pest management. Demonstration sites of 100 hectares were to be established in each of the five districts. Crop husbandry trials were planned to show the benefits of greater crop productivity, crop diversification and intensification, and better water management practices. The concepts of better pest management were to be introduced through an integrated pest management program in each project area. The Tajikistan Academy of Agricultural Sciences (TAAS) was responsible for implementing this output, with support from local and international research institutes. The output was partly achieved.

33. The late signing of the contract delayed TAAS activities, so demonstrations were conducted in 2008 and 2009 instead of beginning in September 2006 as designed. Under the contract between the TAAS and the project management office (PMO), the TAAS was to establish several demonstration plots of up to 20 hectares each in the five districts, with the total demonstration area in each district to be 100 hectares in each year of project implementation. In practice, only a single 20-hectare demonstration plot was implemented in each district. The reason given to the project completion review mission was that the 100-hectare plots were too large for one irrigation system. Consequently, achievement of the demonstration activity was limited.

34. The TAAS demonstrations included (i) sowing schedules, (ii) crop rotation, (iii) green fertilizer application, (iv) crop nutrition, (v) leaching of saline soil, (vi) land leveling, (vii) water management, (viii) crop intensification, (ix) improved seeds, and (x) pest management. The demonstrations indicated that crop yields for wheat and cotton can be improved by applying appropriate fertilizer (nitrogen, phosphorus, and potassium), using high-quality seed, and adopting integrated pest management practices. The number of demonstrations conducted appears to show a lack of focus, and no obvious control plots were implemented to make meaningful comparisons for increased performance.

35. The TAAS did not meet the required target of 2,500 farmers trained (25% women). It conducted only 26 training workshops in 2008–2009 across the five districts: 4 in Asht, 7 in Farkhor, 7 in Pyanj, 4 in Rushan, and 4 in Vahdat. In total, 773 people (34% women) were trained: 100 in Asht, 230 in Farkhor, 250 in Pyanj, 95 in Rushan, and 98 in Vahdat. The limited numbers in each district reflect a poor awareness by farmers of the training workshops.

4. Agricultural Policy and Market Reforms

36. The Government of Tajikistan agreed to implement pilot-based reform actions in the project areas by 31 December 2006, including (i) improving farm structure, operations, and management based on market principles; (ii) removing cotton production quotas and involving local authorities in directing cotton credit; (iii) issuing tradable land lease certificates; and (iv) introducing open cotton sales. The output was achieved.

37. Tajikistan cotton prices are now linked to world prices. A joint regulation by the Ministry of Economic Development and Trade and the Agriculture Ministry in 2007 established a methodology for calculating cotton prices.¹⁶ A resulting government decree was introduced on 5 March 2008 to base cotton prices on the Liverpool Index A exchange price.

38. Tajikistan cotton farmers had a high accumulation of debts (approximately \$511 million as of 30 December 2008) and relied heavily on investors for cotton inputs.¹⁷ A president decree in 2009 waived the debts accrued by cotton farmers.¹⁸ This diminished the relationship between farmers and investors for future provision of inputs. To purchase inputs, farmers now rely on their own funds or borrowing from banks and microfinance institutions and to a much less extent on investors. Transactions between farmers and investors are now largely on a cash basis.

39. No restrictions remain on the sale of raw cotton between districts. A government resolution in 2009 canceled control of the planning, processing, and selling of raw cotton in districts.¹⁹

40. Cotton financing and production contracts are now based on a standard, government-approved format. A template prepared as part of the technical assistance was adopted by the government as part of the May 2009 President Decree.

41. A law was introduced in 2008 to allow farmers to use land right certificates as collateral for bank loans.²⁰ However, it has been ineffective: banks refuse to accept the certificates because they are not tradable assets.

C. Project Costs

42. The project was implemented within budget. The project cost was \$28.67 million, as compared with \$29.01 million estimated at appraisal (Basic Data C.1). ADB financing amounted to \$23.24 million (Basic Data C.2), including interest during construction (\$0.62 million). ADB financed 81% of project costs, slightly more than the 78.3% appraisal estimate, because its financing of the capital works cost category increased from 61% to 69%.

43. The project costs for I&D systems rehabilitation output of \$21.54 million (Basic Data C.3) slightly exceeded the appraisal estimate of \$21.43 million. The project costs for water supply

¹⁶ Ministry of Economic Development and Trade and Agriculture Ministry. 2007. "Procedure of calculation of releasing and marginal sizes of transportation and realization expenses related to selling of cotton." 15 March.

¹⁷ Investors is a term applied to local traders who supply inputs in-kind during planting periods and in return farmers deliver raw cotton to a pre-determined gin for processing, and then repays the local investor for the loan by providing an agreed amount of raw cotton.

¹⁸ President Decree. 2009. "Of additional measures to support agriculture in the Republic of Tajikistan." 30 May 2009.

¹⁹ Government Resolution No. III. 2009. "On approval of plan of action for solving the debts of cotton growers of Republic of Tajikistan for 2007 to 2009." 5 March 2009.

²⁰ Law No. 364 (Clauses 45–49). "On Mortgage." 20 March 2008.

systems output of \$2.31 million were comparable to the appraisal estimate of \$2.45 million. The project costs for improved agricultural technologies output of \$0.22 million were considerably less than the appraisal estimate of \$0.87 million. The project costs for policy and market reforms output of \$3.84 million exceeded the appraisal estimate of \$3.30 million by about 20%.

44. Actual project costs increased for (i) civil works—\$11.62 million compared with \$9.33 million (25% more), and (ii) consulting services—foreign—\$2.68 million compared with \$1.64 million (63% more) (Appendix 5). The main decreases by category were for (i) equipment—\$12.16 million compared with \$13.36 million (9% less); (ii) training, extension, and studies—\$0.37 million compared with 1.17 million (68% less); (iii) consulting services—local—\$0.04 million compared with \$0.55 million (92% less); and (iv) office and staff costs—\$0.98 million compared with \$1.11 million (11% less).

45. The difference between actual and appraisal costs for civil works and equipment was caused by the addition of the flood protection works in Hamadoni. Likewise, the increase in foreign consultancy costs was caused by the need for additional construction designs for the activities in Hamadoni. The substantial decline in costs for training, extension, and studies reflects the reduced attention by project management to implementing activities related to the improved agricultural technologies output.

D. Disbursements

46. Total disbursements under the loan were \$23.24 million (including interest during construction of \$0.62 million) (Appendix 5). This was 2.3% higher than the approved loan amount (\$22.72 million).²¹ The foreign currency amount disbursed was \$16.15 million, and the local currency amount disbursed was \$7.09 million. Disbursement began in 2005, as expected at appraisal. Retroactive financing for start-up expenditures (procurement of office equipment, repairs to project management office) incurred from 1 October 2004 to 5 September 2005 was provided for in the loan agreement. Disbursement for retroactive financing remained within the ceiling of \$100,000.

47. An imprest account was established at the Tajiksodirot Bank with an initial advance of \$100,000. The imprest account ceiling was adjusted on three occasions. In July 2006 it was raised to \$400,000 to defray expenses incurred in procuring vehicles for regional offices and conducting surveys and investigations of the irrigation and drainage systems. In February 2007 it was raised to \$1 million following agreement during the November 2006 review mission to fund contracts awarded for construction works in Hamadoni district and the Faizabadqala-1 pump station in Pyanj district. In May 2007 it was raised to \$1.5 million to improve the cash flow for civil works expenditures. The imprest account was liquidated before loan closing in August 2011.

48. There were two reallocations of loan proceeds. On 22 November 2006, consulting services were split into two cost categories; foreign and local. On 15 July 2010, proceeds were reallocated from the equipment cost category to the civil works one to correct erroneous charging of some equipment contracts to civil works.

²¹ This was mostly attributable to currency fluctuations, as the dollar appreciated from SDR 1.149 during loan negotiations to SDR1.611 on the loan closing date.

E. Project Schedule

49. The project was approved on 10 December 2004, the loan agreement was signed on 25 May 2005, and the loan became effective on 6 September 2005. Project implementation began without undue delays.

50. The physical completion of the project was 31 December 2010, and the loan was closed on 23 August 2011. An extension to the loan closing date from 30 June to 31 August 2011 was approved on 4 August 2010, to cover the fees for a required part-year audit for the period from 1 January to 30 June 2011.

51. The project was implemented according to schedule (Appendix 6). Some delays occurred in beginning some infrastructure rehabilitation activities, yet most were completed on schedule. The longest delays were incurred in the improvement of drinking-water supply systems for Farkhor (Gulshan village) and Vahdat (Sirriganj village)—about 12 months in each case.²² There was also a substantial delay in implementing the on-farm demonstration plot activities.

F. Implementation Arrangements

52. The Ministry of Water Resources and Land Reclamation (MWRLR) was the project executing agency (EA). The PMO, led by a full-time manager, was established in September 2005 within the MWRLR to manage project activities and liaise with ADB. A high-level project steering committee (PSC), headed by the deputy prime minister, was established in August 2005. It provided policy guidance and facilitated interministerial coordination. Four regional offices were established in Asht, Farkhor, Pyanj, and Rushan. Activities in Vahdat were managed from the PMO.

53. The project was implemented as designed at appraisal, and the implementation arrangement is considered adequate in terms of the delivery of project outputs and the achievement of the project purpose, except for the output of improved agricultural technologies. Quarterly and annual progress reports on project implementation were submitted on time to ADB and relevant government agencies.

G. Conditions and Covenants

54. The loan covenants were mostly relevant and complied with (Appendix 7). A covenant regarding funding of O&M was not complied with, because the government does not provide sufficient funds to meet the full costs of maintenance of the irrigation systems each year.

55. The borrower was slow in complying with the policy-based covenants. There were delays in complying with the provisions under sector policy and reform, particularly the covenants to abolish planning targets for cotton and the restrictions on financing and processing of cotton.

²² The delay in Farkhor occurred because the poor condition of existing pipework required that new pipes be installed. In Vahdat a change in the target village required a new design.

H. Related Technical Assistance

56. The technical assistance grant for \$500,000 was approved on 10 December 2004, the contract was signed on 18 February 2005, and consultants were fielded on 10 November 2005.²³ The assistance lasted just over two years, closing on 31 December 2007. The expected impact was support for the implementation of policies conducive to both public support for and private investments in agriculture and agricultural services. The expected outcome was assistance to the government in (i) monitoring progress in implementing policy reforms that would create an environment conducive to project implementation; (ii) promoting competitive providers of farm inputs, technical advice, credit, and marketing of products in the project areas; and (iii) establishing the WUASU within MWRLR. The technical assistance provided support to the PMO and overall was rated as successful.²⁴

I. Consultant Recruitment and Procurement

57. Consultant recruitment was undertaken in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). At appraisal 685 person-months of consulting services (79 international and 606 national) were proposed. An international firm was recruited and national consultants were hired individually. The contract for a period of five years was signed on 6 September 2006. Three addenda were made to the contract for the preparation of feasibility studies for the Hamadoni district activities, and for the detailed design and construction supervision of the rehabilitation works. The final contract was for 700 person-months (82 international and 618 national) (Appendix 8). The consultants were based in the PMO office and began activities on 21 October 2006.

58. The TAAS was identified in the Report and Recommendation to the President (footnote 4) to implement the output of agriculture support to farmers and was contracted through direct selection. The contract was signed on 25 September 2007 and completed in December 2010.

59. Civil works, goods, and services were procured in accordance with *ADB's Procurement Guidelines* (2010, as amended from time to time). During the project implementation period, 69 tenders were conducted for procurement of goods, civil works, and services: 8 contracts were awarded through international competitive bidding, 27 contracts were awarded through national competitive bidding, and 10 contracts were awarded by direct purchasing. All civil works contracts were procured through prequalification in accordance with the loan agreement.

J. Performance of Consultants, Contractors, and Suppliers

60. The performance of the key consultants, contractors, and suppliers was mostly satisfactory. Local civil works contractors performed satisfactorily with most contracts being completed to an acceptable standard and on schedule.

61. The implementing consultant provided satisfactory support to the MWRLR, particularly in assistance on the civil works components. However, the quality of the M&E system and its application throughout the project and at project completion was poor. Moreover, the consultants did not conduct a project completion survey to allow comparisons against the baseline survey.

²³ ADB. 2004. *Support for Monitoring Policy Reforms and Improving Farm and Water Management (TA 4472-TAJ)* Manila.

²⁴ ADB. 2008. *Technical Assistance Completion Report: Support for Monitoring Policy Reforms and Improving Farm and Water Management (TA 4472-TAJ)*. Manila.

62. The performance of the TAAS was unsatisfactory. The PMO expressed concern about its slow implementation of activities and proposed inviting an alternative company to deliver the output of improved agricultural technologies if the TAAS did not achieve sufficient progress. The number of on-farm demonstration plots that were implemented was considerably fewer than the number in the contract, and only limited extension and training activities were conducted using the demonstration outcomes. The project completion review was hindered in its assessment of the TAAS by (i) the absence of the key researcher, who had retired, and the lack of knowledge of the work, and (ii) the lack of an English translation of the final report. The TAAS failed to submit quarterly reports in English to ADB as required in its contract with the PMO.

K. Performance of the Borrower and the Executing Agency

63. The borrower's performance was satisfactory. There were no significant delays in payments to contractors. The PSC was established and met regularly in the early phases of implementation and was effective in providing guidance. The PMO was established on schedule and effectively performed duties in implementing the project: all civil works subprojects were largely completed on schedule and within budget, a commendable effort considering the large number of civil works and equipment contracts. The MWRLR prepared a project completion report on time. It demonstrated sufficient capacity to implement irrigation rehabilitation projects. However, it demonstrated less capacity and interest in the on-farm demonstration and farmer training activities, resulting in inferior performance on the improved agricultural technologies output. The overall performance of the MWRLR is rated satisfactory.

L. Performance of the Asian Development Bank

64. During project implementation, ADB undertook one inception mission, five annual review missions, one midterm review mission, and one project completion review mission between 2005 and 2012. Three project officers were responsible for project implementation, the first for 26 months, the second for 6 months, and the third for 26 months. Three project analysts were assigned to the project. Overall, there was sufficient continuity in staffing and effectiveness in resolving issues and guiding the PMO on key matters. ADB assessed bidding documents and approved the large number of procurement and civil works contracts within an acceptable period of time.

65. ADB responded appropriately to the government's request to add flood protection works in Hamadoni district. ADB also properly responded to the NGO complaints in Vahdat and Asht districts. In both cases ADB requested clarifications from the MWRLR and undertook site visits. It conducted a special review mission for the Asht district complaint.

66. During the initial phases of the project, ADB appropriately focused on ensuring the implementation of the civil works packages. However, ADB did not ensure that the activities of improved agricultural technologies were implemented properly, and it did not identify that there were deficiencies in the M&E system particularly in agriculture and gender-based data. The M&E system was unable to support the project DMF evaluation and the project completion review mission was forced to collect data from the field to undertake evaluations. The performance of ADB is rated satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

67. The project is rated as **relevant** as it is consistent with the government's development priorities as well as ADB's country and sector strategies at appraisal. Despite a change in ADB's investment priorities in Tajikistan (footnote 10), irrigation infrastructure remains a priority investment in the the Tajikistan's National Development Strategy (footnote 6) and ADB's Strategy 2020.²⁵ The project facilitated the rehabilitation of irrigation infrastructure, which at the time was seriously degraded throughout the country, owing to the lack of adequate maintenance following independence from the former Soviet Union. The assessment of the problems and opportunities at appraisal was adequate.

68. The project has high relevance for districts in Tajikistan. In many instances local economies depend almost entirely on irrigated agriculture. Without reliable supplies of irrigation water, these areas would see substantial economic hardship and possibly interregional migration.

B. Effectiveness in Achieving Outcome

69. The project is rated as **effective**. The project outcome of improved agricultural productivity, incomes, and access to potable water supply systems was largely achieved by implementation of the outputs, with two outputs being fully achieved and two partly achieved.

70. One of the key performance indicators for outcome achievement was the rehabilitation of I&D infrastructure over an area of 47,500 hectares. The project benefited an area of 55,368 hectares, which is commendable given the change in implementation arrangements to include the civil works for flood protection in Hamadoni district. Although the number of beneficiaries with safe drinking water at project completion was less than the appraisal target, an increase is expected in some districts as new people move into the communities. The outmigration caused by the previous loss of water supply is expected to be reversed.

71. The yield gains for cotton and wheat are in line with the targets at appraisal. Two outcome indicators were not measured by the project management and were not available during the project completion review: (i) cropping intensity, and (ii) increase in household incomes. It is likely that both made gains because the area of irrigated agricultural land increased, and crop yields and global commodity prices improved during the implementation period.

C. Efficiency in Achieving Outcome and Outputs

72. The project's use of resources is rated as **efficient** based on a combination of the measured economic internal rate of return (EIRR) and inclusion of unquantified benefits.²⁶ The overall EIRR of the project (excluding the Hamadoni emergency works) was 11.8% (Appendix 9). The project generated unquantifiable benefits from the improved potable drinking water supply systems not included in the derived EIRR. They include (i) the reduced incidence of waterborne diseases from improved water quality, which resulted in social benefits such as reduced absences from school, improved labor productivity, and reduced health care costs; and

²⁵ ADB. 2008. *Strategy 2020, The Long-Term Strategic Framework of the Asian Development Bank 2008–2020*. Manila.

²⁶ ADB. 2006. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Manila.

(ii) the increase in time available to women for other tasks following the elimination of the need to collect water from canals or streams. These unquantified benefits contribute to the rating of economically efficient.

73. The EIRRs of each I&D subproject varied by location: 9% in Asht, 16% in Farkhor, 16% in Pyanj, 10% in Rushan, and 21% in Vahdat. The total EIRR of the I&D investments across the five districts was 12.3%.²⁷ In comparison, the appraisal estimates by district were 16% in Asht, 26% in Farkhor, 19% in Pyanj, 13% in Rushan, and 23% in Vahdat.

74. The efficiency of the individual water supply subprojects were evaluated and found to be efficient (Appendix 9).

76. The Asht cascade system, which required a significantly higher investment, did not address the irrigation constraints to the same extent as the work at the other sites. These constraints affect large parts of the command areas in higher locations, especially those dominated by high-value apricot orchards, and limit future extensions of the command area. Although the project investment in pump stations at lower levels of the cascade increased the potential of these orchards, ongoing equipment failures limit the opportunity to capture the benefits of the investment. The project impact on the district was significant, as the production and export of apricots increased employment and contributed to industry development.

77. With the exception of Rushan, the remaining I&D subprojects were efficient because the increased yields generated were accompanied by rapid increases in commodity prices, especially for cotton and to a lesser extent wheat. The investments also enabled diversification into high-value vegetable crops, especially in Vahdat. The increase in cropping intensity claimed as an effect of the project was not substantially different from the gains shown by data across the district data and was not attributed to the project. Data on crop diversification in a without-project scenario were not available to test for project impacts separately from broader industry trends.

78. The potential benefits from the project would have been considerably greater had there been widespread farmer adoption of the technologies included in the agriculture demonstrations. The demonstration crop performance data for improved cotton and wheat yields provided by the technical assistance indicate significant potential to improve agricultural productivity and farmer incomes, and consequently achieve a more efficient and sustainable investment in irrigation infrastructure rehabilitation (Appendix 9).

D. Preliminary Assessment of Sustainability

79. The sustainability of the project is assessed as **less likely**. The key factor in sustaining investments in the rehabilitation of irrigation infrastructure is ensuring adequate annual O&M. Although the government implemented several resolutions, the project was unable to ensure full cost recovery from water fees. As a result, WUAs remain underfunded and unable to implement adequate O&M. Thus, there is a real possibility that the deferred maintenance problem that plagues such irrigation schemes will persist and the physical infrastructure may further degrade.

80. The maintenance of economic benefits from the upgraded infrastructure is constrained by the degraded quality of the remaining infrastructure. As the quality of the infrastructure not included in the rehabilitation program declines further, the benefits from the partial upgrading of

²⁷ This excludes the agriculture, water supply system and project management components benefits and costs.

infrastructure within irrigation districts will diminish. To secure a more sustainable outcome, systemwide rehabilitation will be required in the future.

E. Impact

81. **Poverty impact.** The project was expected to have a significant impact on poverty as an estimated 70% of beneficiaries were classified as poor. The lack of disaggregated data by farm type and household prevents reevaluation of the impact in quantitative terms. The close relationship between (i) land ownership and agrarian structure; and (ii) poverty levels at appraisal, especially for households and farms involved in cotton production, may not hold under the significant changes to land ownership and the dramatic rises in international cotton prices. Although the impact performance target was not measured by the M&E system, there is a strong likelihood that the scale of benefits for I&D subprojects would result in significant impacts on poverty. The impact of the water supply subprojects was significant for the users who received piped water. The majority of the beneficiaries were in marginalized or vulnerable communities.

82. **Social impact.** The project met the targets set for reducing the incidence of waterborne diseases. Consequently, the health of community members in the project areas improved, which will result in a range of social benefits, such as reduced healthcare costs, improved labour productivity, and greater attendance of children at schools.

83. **Environmental impact.** The project was classified under environment category B. It had no adverse environmental impacts. Positive environmental impacts are associated with reductions in areas of waterlogged and saline soils. The demonstration plots also indicated that better crop management could reduce the incidence of soil erosion.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

84. Overall, the project was implemented as designed, operated within budget, and completed on time. It added flood protection activities in Hamadoni without diminishing the original scope. The requirements of the DMF were mostly met, with partial success in some areas, such as undertaking the on-farm demonstration and training activities and ensuring sustainable O&M of the systems. In accordance with the project performance rating criteria, the overall rating of the project is **successful**.

B. Lessons

85. The following key lessons were identified:

- (i) Partial rehabilitation of irrigation systems is less effective than complete rehabilitation. Two issues arose from the partial rehabilitation approach: (a) significant infrastructure constraints remained following the partial rehabilitation, limiting the effectiveness and efficiency of the investment; and (b) there were public misconceptions about the rehabilitation program, which contributed to the project complaints raised by NGOs.
- (ii) Infrastructure rehabilitation projects dispersed over a broad geographic area are harder to implement and have higher administrative burdens and management costs than more regionally concentrated projects.

- (iii) There is a high project administration burden associated with a large number of civil works and equipment contracts.
- (iv) Improving on-farm agricultural productivity is important for project efficiency and sustainability. Access to irrigation water is not the only constraint on improving crop yields. Higher farm incomes from yield improvements due to productivity gains make it easier to pay water use fees and sustain O&M of irrigation infrastructure.
- (v) The MWRLR did not have the expertise to deliver the output of improved agricultural technologies. An alternative implementing agency such as the Ministry of Agriculture and Rural Development may have had more success in delivering this output.

C. Recommendations

1. Project Related

86. **Future monitoring.** Continued monitoring is needed on the government's commitment to complete the works in Asht district identified in the NGO complaint.

87. **Covenants.** Duplication of project output performance indicators in the form of covenants should be avoided. For policy issues such as those included in the project covenants, requirements can instead be stated in terms of government actions (such as passing legislation). Performance indicators should measure changes in behavior at the farm level that result from the policy—that is, they should measure the outcome of the policy.

2. General

88. In designing projects, attention needs to be given to the following:

- (i) Focus should be on full rather than partial rehabilitation of irrigation systems.
- (ii) Including a well-resourced component to improve agricultural productivity is important for ensuring the long-term sustainability of the irrigation infrastructure investment. Selection of an appropriate implementing agency is critical to the implementation success of such components.
- (iii) A large number of small contracts could be avoided through adoption of a centralized procurement of equipment such as pumps and motors and through the use of district wide civil works contracts.
- (iv) Sufficient funds should be raised through water use levies or government contributions to ensure the sustainability of WUAs and coverage of O&M costs.

89. In implementing projects, attention must be given to the M&E system. A quality M&E system must be in place to enable comprehensive project management and evaluation. One option for achieving such a system is to contract the M&E consultants independently from the implementation consultants, to ensure they are present at start-up to establish the baseline and develop data systems, at midterm to review and report progress, and at completion to produce a completion survey and impact reporting.

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	Achievements at Project Completion
Impact Living standards of the rural population in the project areas (Asht, Farkhor-Chubek, Pyanj, Vahdat, and Rushan) are improved	<ul style="list-style-type: none"> Incidence of income poverty in the project areas reduced by 5% by 2013 compared to 2004 Incidence of waterborne diseases in the project areas decreased by 20% by 2013 compared to 2004 	<p>Not measured</p> <p>Incidence of waterborne disease decreased in project areas: (i) typhoid – 33-100%; (ii) malaria – 66-96%; (iii) hepatitis/diarrhea – 14-60%</p>
Outcome Agricultural productivity, incomes and access to potable water supply systems for rural communities are improved	<ul style="list-style-type: none"> I&D infrastructure over an area of 47,500 ha rehabilitated by Sep 2010 Average cotton yield in the project areas increased by 19% by Dec 2010 compared to 2004 baseline Average wheat yield in the project areas increased by 21% by Dec 2010 compared to 2004 baseline Cropping intensity in the project areas increased from 100% in 2004 to 105% in Dec 2010 	<p>Total benefit area 55,368 ha (23,343 ha direct, 32,025 ha indirect) Asht – 11,580 ha (7,300 ha direct, 4,280 ha indirect) Farkhor – 18,414 ha (3,914 ha direct, 14,500 ha indirect) Pyanj – 16,604 ha (3,359 ha direct, 13,245 ha indirect) Rushan – 1,270 ha (1,270 ha direct, 0 ha indirect) Vahdat – 7,500 ha (7,500 ha direct, 0 ha indirect)</p> <p>Average increase – 15% Asht – 10% Farkhor – 18% Pyanj – 14% Rushan – no cotton grown Vahdat – no irrigated cotton before project in benefit areas</p> <p>Average increase – 22% Asht – no wheat grown in project area Farkhor – 17% Pyanj – 21% Rushan – 5% Vahdat – 52%</p> <p>Not measured</p>

	<ul style="list-style-type: none"> • Farm household incomes in the project areas increased by 10% from 2004 to Dec 2010 • Safe drinking water made available to an additional 46,000 beneficiaries by 31 Dec 2010 compared to 2004 baseline 	<p>Not measured</p> <p>Total beneficiaries – 31,620 Asht – 5,020 Farkhor – 5,200 Pyanj – 600 Rushan – 5,800 Vahdat – 15,000</p>
Outputs 1. Selected I&D systems rehabilitated and improved O&M is in place	<ul style="list-style-type: none"> • 250 km of irrigation canal systems, 510 km of secondary canals, 425 km of collector drains, 9 pump stations and associated facilities, 9 headworks including water intake structures in 5 project areas rehabilitated by Sep 2010 • A WUA support unit operational within the MWRLR by May 2007 • The WUA support unit has at least 20% female staff by May 2007. • WUAs operational in core demonstration areas by Nov 2007. • One third of all WUA members are female by Nov 2007. • O&M cost recovery mechanism operational by May 2008 	<p>7 irrigation systems were partially rehabilitated and 4 drainage systems cleaned as planned. 12 headworks and intake structures and 13 pumping stations were rehabilitated.</p> <p>WUASU was established under the Ministerial Order No. 128 in May 2007. 1 central office (Dushanbe), 3 province and 4 district offices established</p> <p>WUASU staff is 13 of which 2 (15%) are female.</p> <p>25 WUAs in 5 districts have been established covering 46,750 ha.</p> <p>WUAs have 18,390 members of which 7,300 (39%) are female.</p> <p>The Ministry of Economic Development and Trade issued the Decree No.10 in June 2007 establishing water supply service fee.</p>

<p>2. Improved potable drinking water supply systems in the selected project areas are available</p>	<ul style="list-style-type: none"> • Water supply schemes servicing population of 57,000 operational by Dec 2010 • Water supply committees operational in each water supply scheme by Dec 2010 • Female representation in each water supply committee is 30% by Dec 2010. • Sustainable O&M of water supply schemes implemented by Dec 2010 	<p>Water supply schemes constructed in Asht, Farkhor, Pyanj, Rushan, and Vahdat. Schemes in the 5 districts service 31,620 people.</p> <p>Water supply committees established in each district</p> <p>Water supply committees employ 37 people of which 8 (22%) are female.</p> <p>Potable water cost recovery and fee structure (CRFS) established in each district. Fee collection rates do not meet O&M requirements.</p>
<p>3. Farmers have adopted improved agricultural technologies</p>	<ul style="list-style-type: none"> • 500 ha of agricultural demonstration plots operational by Dec 2007 • Field, water and crop husbandry demonstrations implemented by Dec 2010 • 2,500 farmers trained by Dec 2010 • 25% of farmers trained are women by Dec 2010. 	<p>Tajikistan Academy of Agricultural Sciences (TAAS) established 20 hectare demonstration plots in each district, a total of 100 ha of demonstration plots.</p> <p>Demonstrations consisted of (i) sowing schedules, (ii) crop rotation, (iii) green fertilizer application, (iv) crop nutrition, (v) leaching saline soil, (vi) land leveling, (vii) water management, (viii) crop intensity, (ix) improved seeds, and (x) pest management.</p> <p>Total of 773 people trained Asht – 100 people Farkhor – 230 people Pyanj – 250 people Rushan – 95 people Vahdat – 98 people</p> <p>Of 773 people trained, 261 (34%) were female.</p>

<p>4. Agricultural policy and market reforms are operational</p>	<ul style="list-style-type: none"> • Farm-gate cotton prices in project areas based on world prices by Dec 2007 • A government resolution allows multiple investors in project areas by Dec 2007. • A government resolution allows farmers to sell raw cotton to gins of their selection within and outside the district boundaries by Dec 2007. • All cotton financing and production contracts based on the standard, government-approved format that assures financial disciplines and sound business practices by Dec 2007 • Amendments to laws prepared to allow farmers to use their land use right certificate as collateral for bank loans by Dec 2007 	<p>Government decree passed 5 March 2008 to base cotton prices on Liverpool exchange price. Tajikistan cotton prices are now directly linked to world prices.</p> <p>The President Decree of 30 May 2009 “Of additional measures to support agriculture in the Republic of Tajikistan” waived the debts accrued by cotton farmers and broke the relationship between farmers and investors for provision of inputs.</p> <p>No restrictions on sale of raw cotton as a result of Resolution No. III “On approval of plan of action for solving the debts of cotton growers of Republic of Tajikistan for 2007 to 2009</p> <p>Template prepared as part of TA 4664-TAJ was adopted by government as part of the President Decree of 30 May 2009.</p> <p>Government resolution introduced for farmers to use land right certificates as collateral for banks loans. Not operational as banks refuse to accept land use right certificates as they are not tradable assets.</p>
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CIVIL WORKS AND EQUIPMENT CONTRACTS

Table A2.1: Asht District

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-CW-ASHT-01	299,193.00	27/11/2007	09/11/2009	"Dilshod" company	Water intake and water intake canal, sedimentation were rehabilitated; forebay concreting was made; pressure pipeline of diameter 2,140 mm was cleaned from ventilated sand at a distance of 270 metres, as well as anticorrosive measures on pipeline protection were taken.
IRP-CW-ASHT-02	286,030.64	19/11/2007	14/11/2009	"Umed-1" company	8 in-farm canals, 13 hydrotechnical structures were rehabilitated; 1,418 metres of concrete chutes and 23 valves were repaired.
IRP-CW-ASHT-3	465,775.40	26/11/2007	30/10/2009	SUE PMK-26 "Sughdobsokhtmon" company	Existing discharge embankment through Pongozsay, intake structures, channels and chutes of 2,916 metres was rehabilitated; gates/valves were replaced.
IRP-EQP-ASHT-04	1,935,520.00 96,011.61	16/09/2008	18/06/2010	"Rohat" company	6 pumps with electric motors, also nonreturn valves, accessory equipment and electric control system, vacuum and drainage pumps were replaced. Administrative building of ANS-2 pump station was rehabilitated.
IRP-EQP-ASHT-05	710,816.56	1/10/2008	18/06/2010	"Easteco International" CJSC	2 pumps with electric motors, 2 valves and accessory equipment were replaced. One drainage pump with electric motor (quantity 7.2l/sec), vacuum pump and electric control system were also replaced. ANS-2D pump station building was rehabilitated.

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-CW-ASHT-06	131,094.81	29/05/2009	18/06/2010	"Umed-1" company	ANS-1 and ANS-3B pump station buildings were rehabilitated.
IRP-EQP-ASHT-07	2,994,777.17 100,900.00 65,757.60	11/09/2008	18/06/2010	"Obi Toza" JSC represented by "Ilhom-2" company	2 pumps with electric motors, 2 valves, accessory equipment and electric control system, vacuum and drainage pumps, trash racks were replaced. Electric elevator was installed.
IRP-EQP-ASHT-08	618,071.58	3/10/2008	18/06/2010	"Easteco International" CJSC	3 pumps with electric motors, 3 valves, accessory equipment and electric control system were replaced. Also lifting crane with hoisting capacity of 10 tons was installed.
Sub-total	7,703,948.37				
IRP-CW-ASHT-10	589,504.75	15/01/2008	06/09/2010	"Santechmont age" PMK	2 existing boreholes were rehabilitated. 2 pumps were replaced and the following pipelines: diameter 225 mm, length 4,625 metres; diameter 160 mm, length 968 metres; diameter 110 mm, length 4,600 metres were replaced. Reservoir with capacity of 500 m ³ , guardroom and chlorination station were built.
Total	8,293,458.12				

Source: Project Management Unit.

Table A2.2: Farkhor District

Contract Name	Contract Cost (\$)	Contract Signing	Completion of Contract	Contractor Name	Contract Factors
IRP-CW-FRCH-01	200,393.10	19/11/2007	18/09/2008	"Gayur" company	15 km of canals and 12 km of collectors and drainages were cleaned from silt in Farkhor district.
IRP-CW-FRCH-02	253,818.04	19/11/2007	10/08/2009	"Ramz" company	Canals facing with length 4,316 metres was repaired, 789 metres of which is concrete facing. The canals' buckle network with length 5,776 metres was rehabilitated, including assembly of chutes ЛР-80 at length 2,454 metres.
IRP-CW-FRCH-03	448,173.60	28/08/2008	05/08/2009	"Sughdiyon" company	Pipelines were partially replaced at Urtaboz-1 pump station with length 340 metres (diameter 1,220 mm), in the first pumping area with length 252 metres (diameter 1,020 mm), in the second pumping area with length 91 metres (diameter 1,020 mm), in the third pumping area and Urtaboz-3 pump station pipeline with length 30 metres (diameter 820 mm) was replaced.
IRP-CW-FRCH-04	840,754.08	09/02/2009	06/06/2010	"Muhandison" company	Replacement of pressure pipelines with length 400 metres, diameter 1,220 mm and auxiliary works in Urtaboz-4 and Urtaboz-4a in Farkhor district.
IRP-CW-FRCH-05	95,424.60	05/03/2009	07/10/2010	"Sughdiyon" company	Urtaboz-4 and Urtaboz-4a pump station buildings were rehabilitated; also pump station building was built for accessory plant unit. Pump station premises for the maintenance personnel was repaired.

Contract Name	Contract Cost (\$)	Contract Signing	Completion of Contract	Contractor Name	Contract Factors
IRP- EQP-FRCH-06	800,429.00	22/09/2008	05/08/2009	"Diana & Co." company	6 pumps with electric motors, 6 gates, accessories and electric control systems in Urtaboz-1 pump station were replaced. 3 gates, accessories and electric control systems in Urtaboz-3 were replaced. Works on partially repairing water-pressure reservoirs II and III of pumping areas were completed, as well as hydro-bridges in Urtaboz-1 and Urtaboz-3 pump stations were repaired.
IRP- EQP-FRCH-07	1,196,716.00	15/09/2008	05/08/2009	"Rohat" company	7 pumps with electric motors, 7 gates, accessories and electric control systems were replaced.
Sub-total	3,835,708.42				
IRP-CW-FRCH-09	315,457.54	15/04/2008	06/09/2010	"Somon" company	Drinking water supply systems were rehabilitated in Davlatobod and Navobod villages in Gulshan jamoat of Farkhor district. One borehole was drilled and one pump ЭҚБ-10-65-110 was assembled; besides 2 reservoirs with capacity of 25 m ³ each were installed and auxiliary electric works for the borehole were completed. Assembly of pressure PVC pipelines diameter 160 mm starting from water intake up to reservoir with length 1,950 metres, gravity conduit with diameter 200 mm from the reservoir to Navobod village with length 3,650 metres and gravity conduit diameter 90 mm from the reservoir to Davlatobod village with length 3,053 metres was done as well.
Total	4,151,165.96				

Source: Project Management Unit.

Table A2.3: Pyanj District

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-EQ-CW-PNJ-01	769,160.12 84,070.19	24/08/2007	28/02/2009	"Sughdiyong" company	Glass-plastic pressure pipeline (diameter 1,400 mm, length 800 metres) was supplied and installed; nonreturn valve was assembled; roadway of length 15 metres (crushed-stone, asphalt-concrete) was rehabilitated.
IRP-CW-PNJ-02	780,000.00 72,052.85	22/03/2007	11/09/2009	MPMK "Vakhsh" company	Repair works in Faizabadkala-0 and Faizabadkala-1 pump station buildings were completed; forebay of Faizabadkala-0 pump station was rehabilitated. Also 2 pumps with electric motors, gate and nonreturn valve of Faizabadkala-1 pump station were replaced. Electric control systems in both pump stations and accessory equipment were replaced.
IRP-CW-PNJ-03	788,542.50	29/03/2007	25/12/2009	"Service Bark" company	Glass-plastic pressure pipeline (diameter 1,400 mm, length 800 metres) was supplied and installed; nonreturn valve was assembled; roadway of length 28 metres (crushed-stone, asphalt-concrete) was rehabilitated.
IRP-CW-PNJ-04	420,943.50	19/11/2007	18/03/2010	"Victory" company	Headwork of "Khalkayor" canal and headworks of Kelanchi, Old Shakar and New Shakar canals were rehabilitated. 4 flat gates, electrified elevators in headwork were repaired. Concrete facing at hydro station (length 20 metres) and guardroom were rehabilitated. 3 flat gates were replaced in Kelanchi canal, concrete facing of the structure's left and right slopes (length 10 metres), as well as bed and downstream slopes (length 30 metres) were rehabilitated. Concrete facing of a dissipating basin bed and slopes (length 20 metres);

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
					canal was cleaned from silt at a distance of 200m in Old Shakar canal. 6 gates in discharge outlets of New Shakar canal were placed.
IRP-CW-PNJ-05	349,097.71	19/11/2007	27/10/2009	SUE VGUPSRVKH "Vakhshvodstroy"	12 units of hydrotechnical structures in Kelanchi and Yangi canals, 2 aqueducts in Kizil and Yangi canals were rehabilitated; 2.3 km of Kelanchi and Yangi canals and 1.5 km of New Shakar and Old Shakar canals were cleaned from silt, also 2.5 km of collectors were cleaned.
Sub-total	3,107,743.83				
IRP-CW-PNJ-07	780,718.12	14/09/2009	15/06/2011	"Muhandison" company	2 new boreholes at Namuna settlement were drilled. New pump station building and two reservoirs with capacity of 50m ³ were built in adjacent territory of boreholes. Boreholes were supplied with pumps and motors. Power line with length 3.0 km was constructed to connect pumps with the main power supply line; also transformer was installed at pump station together with a special panel block to provide with uninterrupted power supply. Reservoir with capacity of 500 m ³ was built near Somoni settlement.
Total	3,888,461.95				

Source: Project Management Unit.

Table A2.4: Rushan District

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-CW-RSN-01	550,247.00 14,860.00	27/03/2008	27/03/2008	Gorno Badakhshan Water Management	22 canals were rehabilitated; pipes: polyethylene – 1,980 metres and metal – 71 metres were installed. 22 units of pipe passages, 26 units of gates-water outlets and 8 units of hydrometric bridges were installed in these canals. Headworks along Vomardara river were rehabilitated and banks along Bartang river were strengthened with length 250 metres in Dashti Vomar settlement.
IRP-CW-RSN-02	149,927.00	18/01/2008	18/01/2008	Gorno Badakhshan Water Management	9,500 metres of collector-drainage network was cleaned from silt; Barzud, Rushan and Barushan pump stations and electric control system of the pump stations were rehabilitated, also 1,026 metres of the bank protection embankment was constructed along Pyanj river.
Sub-total	715,034.00				
IRP-CW-RSN-03	259,366.00	28/03/2008	10/06/2010	"Firuz-1" company	Water supply system for Rushan settlement was rehabilitated, including construction of water intake structures, laying of PVC pipelines: B-1 with length 170 metres, B-2 with length 558 metres and B-1-1 with length 400 metres. Total length is 1,128 metres. In addition, guardhouse was constructed, existing reservoir's roof was installed, reservoir and chlorination station were rehabilitated. Standpipes were installed along the settlement streets as well.
Total	974,400.00				

Source: Project Management Unit.

Table A2.5: Vahdat District

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-CW-VHD-01	373,905.60	22/11/2007	01/06/2010	"Tajikhydroenergostroy" JSC	Headwork water gate in Dashtibed main canal was rehabilitated; 108.85 metres of guide spur was constructed along Kafarnigan river; 140 metres of Kafarnigan river right bank was strengthened in the spur downstream; catastrophic water escapes and water outlets were rehabilitated; spillway canal was cleaned.
IRP-CW-VHD-02	354,600.00	19/11/2007	01/06/2010	"Firuz-1" company	Mud flow water escape and 400 metres of aqueduct were rehabilitated; trash rack was installed.
IRP-CW-VHD-03	369,740.00	10/01/2008	07/09/2010	Vahdat district company No. 10	Head water intake in Rohati main canal was rehabilitated including the gates repair, electric motors replacement, assembly of distribution networks and auxiliary electric works; as well as construction of submerged stone embankment in downstream of head intake to provide with secured water drainage to Rohati canal; aqueduct at PK 23 was rehabilitated.
Sub-total	1,098,245.60				
IRP-CW-VHD-04	316,348.51	19/11/2007	28/09/2010	"Davron 2004" company	7 villages in Simiganj jamoat were supplied with water. The villages are: Pyanjikon, Kipchok, Nozirobod, Tangai-1, Tangai-2, Tangai-3 and Kalon. Water sources in these villages except Kalon were existing boreholes; 2 new boreholes were constructed for Kalon village. All existing boreholes were cleaned and pumped. Each borehole was supplied with new pump.
Total	1,414,594.11				

Source: Project Management Unit.

Table A2.6: Hamadoni district

Contract Name	Contract Cost (\$)	Date of Contract Signing	Date of Contract Completion	Contractor Name	Contract Factors
IRP-CW-HMD-01	243,862.23	16/02/2007	01/09/2008	"Ramz" company	Constructed 5 spurs and 15 blankets. Slope beginning from spurs bottom was protected by the blocks sizes 2x1x1m and gabion mats which were constructed up to 5m stream canal low level to protect from possible washout.
IRP-CW-HMD-02	801,516.05	16/02/2007	01/09/2008	PMK -12 company	
IRP-CW-HMD-03	988,777.55	14/02/2007	01/09/2008	"Gayur" company	
IRP-CW-HMD-04	928,907.42	16/02/2007	01/09/2008	"Obshoron" company	
IRP-CW-HMD-05	222,809.02	16/02/2007	01/09/2008	"Neki" company	
Total	3,185,872.27				

Source: Project Management Unit.

WATER USER ASSOCIATIONS AND WATER SUPPLY COMMITTEES

Table A3.1: Water User Associations

District	Water user association	Location (jamoat)	Date of Registration	Irrigated area (ha)	Number of dehkan farms	WUA members	
						Total	Women members
Asht	MTS	Jarbulok	10/08/2007	1,768	55	2,251	675
	Shakarkul	Pongoz	13/08/2007	288	3	69	31
	Sirdaryo	Shodoba	06/09/2007	1,583	12	605	264
	M/ Vohidov	Shaidon	14/09/2007	673	15	240	100
	Hamfikron	Pongoz	14/09/2007	476	29	140	56
	Oshoba	Oshoba	26/10/2007	1,020	40	158	62
Farkhor	Urtaboz	Gulshan	30/05/2007	3,360	91	546	410
	Sairob	Zafar	30/05/2007	2,080	105	630	472
	Karl Marx	Gairat	30/05/2007	2,290	68	408	306
	Communism	Dehkonorik	30/05/2007	2,396	96	576	432
	Vatan	Vatan	30/05/2007	3,455	81	486	364
	Sangak Safarov	Comsomol	30/05/2007	2,495	57	342	256
	Surkhob	Galaba	30/05/2007	2,848	63	378	284
Pyanj	Kumsoy	Namuna	03/05/2007	2,829	62	608	502
	Obshoron	Kuldimon	03/05/2007	2,013	99	730	502
	Tugul	Tugul	03/05/2007	1,743	66	1,800	765
	Navruz	Arab	03/05/2007	2,731	156	618	482
	Sarmantoy	Sarmantoy	03/05/2007	2,800	112	1,304	422
Rushan	Nur	N. Dodikhudoev	24/07/2007	474	0	301	184
	Hayot	Rushan	16/08/2007	363	0	261	160
Vahdat	Dashtibed	A. Abdulvosiev	22/02/2007	1,106	115	340	180
	Kanali Hazora	A. Abdulvosiev	28/08/2007	739	168	323	173
	Obi Hayoti Bahor	Bahor	30/08/2007	693	72	144	84
	Shabbodai	Chuyangaron	25/09/2007	1,205	90	180	100
	Chuyangaron						
	Obodkori-Tangai	Semiganj	15/11/2007	960	134	268	168

Source: Project Management Unit.

Table A3.2: Water Supply Committees

District	Water supply committee	Villages	Water supply scheme capacity ^a (m ³)	Number of users	Registration date	Secretariat		Water service fee	Collection rate - 2011 (%)
						Total	Female		
Asht	Shaidon "Chashma"	1	14,326	4,220	Nov 2007	9	2	DR30/m3	90
Farkhor	Gulshan "Vahdati milli"	2	6,845	5,200	Feb 2008	12	3	TJS1 person/month	95
Pyanj ^c	Somoni (Namuna) "Obi Pyanj"	1	11,784	600	Aug 2007	5	0	TJS3 person/month	95
Rushan	Rushan "Obi zulol"	1	6,668	5,800	Dec 2007	6	2	DR40/m3	98
Vahdat ^b	Semiganch "Kalon"	6	11,233	15,000	Dec 2009	5	1	TJS10 household/month	70
Total		11	50,856	30,820					
Average						7.4	1.6		90

DR = Tajikistan dirams (DR100=TJS1); TJS = Tajikistan somoni.

^a Source: Government project completion report.

^b Number of users in Vahdat district include indirect users who are accessing water supply scheme outside of the service area.

^c Number of covering villages in Pyanj district was decreased from two to one because of the relocation of one village to another location outside of the service area due to the heavy damage of flood in summer 2009.

TRAINING AND WORKSHOPS BY TAJIK ACADEMY OF AGRICULTURAL SCIENCES

Table A4: Workshop participants

Topic	Date	Number of participants	Women participants
Asht			
Efficiency of improved crop seeds	15/2/2009	25	8
Improved crop yields	25/4/2009	25	9
Water conservation technologies	7/6/2009	25	7
Protection from pests and diseases	5/8/2009	25	8
Subtotal		100	32
Farkhor			
Technology for irrigated winter crops	15/10/2008	30	10
Efficiency of improved crop seeds	20/03/2009	30	9
Reseeding for additional farm income	12/6/2009	30	8
Improved crop yields	10/4/2009	40	13
Water conservation technologies	27/7/2009	30	8
Protection from pests and diseases	18/8/2009	40	15
Procedures for seed collection	26/8/2009	30	10
Subtotal		230	73
Pyanj			
Technology for irrigated winter crops	20/10/2008	30	10
Efficiency of improved crop seeds	18/3/2009	30	9
Reseeding for additional farm income	12/5/2009	30	11
Improved crop yields	9/4/2009	50	18
Water conservation technologies	26/7/2009	30	9
Protection from pests and diseases	11/8/2009	50	17
Procedures for seed collection	20/8/2009	30	9
Subtotal		250	83
Rushan			
Technology for irrigated winter crops	10/10/2008	20	10
Efficiency of improved crop seeds	18/3/2009	20	9
Reseeding for additional farm income	10/5/2009	25	11
Improved crop yields	18/4/2009	30	14
Subtotal		95	44
Vahdat			
Technologies for wheat production	28/2/2009	20	6
Technologies for potato production	7/4/2009	18	4
Protection from pests and diseases	13/8/2009	30	9
Intensive use of irrigated lands	22/8/2009	30	10
Subtotal		98	29
Total		753	261

Source: Project Management Unit.

PROJECT COSTS AND DISBURSEMENTS

Table A5.1: Project Costs by Category
(\$)

No.	Category Title	Appraisal Estimate			Actual		
		ADB	Government	Total	ADB	Government	Total
01	Civil Works	5,719,344	3,609,680	9,329,024	8,009,391	3,609,680	11,619,071
02A	Equipment	11,555,594	1,803,410	13,359,004	11,222,181	935,000	12,157,181
02B	Vehicles	188,055	19,040	207,095	169,708	19,040	188,748
02C	Materials	308,749	-	308,749	11,437	-	11,437
03	Training, Extension & Studies	1,173,545	-	1,173,545	370,183	-	370,183
04A	Consulting Services - Foreign	1,643,382	-	1,643,382	2,678,318	-	2,678,318
04B	Consulting Services - Local	546,335	-	546,335	42,734	-	42,734
05	Office and Staff Costs	245,800	862,270	1,108,070	120,749	862,270	983,019
06	Interest Charge	684,942	-	684,942	616,508	-	616,508
07	Unallocated	654,775	-	654,775	-	-	-
	Total	22,720,522	6,294,400	29,014,922	23,241,209	5,425,990	28,667,199

Source: Asian Development Bank.

Table A5.2: ADB Disbursements by Year
(\$)

No.	Category Title							
		2005	2006	2007	2008	2009	2010	2011
01	Civil Works	-	400,000	2,724,493	2,481,912	1,957,903	431,038	14,045
02A	Equipment	46,319	12,074	1,393,857	3,069,438	5,280,261	1,265,232	155,000
02B	Vehicles	-	141,878	23,330	-	4,500	-	-
02C	Materials	-	2,400	3,750	3,875	1,412	-	-
03	Training, Extension & Studies	-	-	108,792	171,819	53,422	36,150	-
04A	Consulting Services - Foreign	-	273,945	1,520,179	339,208	237,699	202,453	104,834
04B	Consulting Services - Local	-	-	21,725	-	-	-	21,009
05	Office and Staff Costs	53,681	36,146	11,934	7,018	4,126	7,844	-
06	Interest Charge	-	3,035	30,365	88,616	163,652	212,571	118,269
07	Unallocated	-	-	-	-	-	-	-
99	Imprest Account	-	-	-	-	-	-	-
	Total	100,000	869,478	5,838,424	6,161,888	7,702,975	2,155,289	413,157

Source: Asian Development Bank.

Table A5.3: ADB Expenditure by Component

(\$ '000)

	Asht	Rehabilitation, Irrigation and Drainage Infrastructure					Mgt	Rural water	Agric support	Project mgt	Total
		Farkhor	Hamadoni	Pyanj	Rushan	Vahdat					
A. Civil works											
A.1 Off-farm	695	1,413	2,209	973	493	740	-	-	-	-	6,523
A.2 Minor civil	82	66	-	-	-	-	-	-	-	-	148
A.3 Water supply	399	-	-	569	179	193	-	1,339	-	-	1,339
Subtotal	776	1,478	2,209	973	493	740	-	1,339	-	-	8,009
B. Equipment											
B.1 Office	-	-	-	-	-	-	-	-	-	54	54
B.2 Pumps etc	6,065	1,728	-	853	-	-	28	-	-	-	8,675
B.3 Pipes etc	-	-	-	760	-	-	201	2	-	-	963
B.4 Other	262	486	-	719	-	-	62	-	-	-	1,530
Subtotal	6,327	2,214	-	2,332	-	-	292	2	-	54	11,222
C. Vehicles	-	-	-	-	-	-	5	-	-	165	170
D. Materials											
D.1 Office and labor	-	-	-	-	-	-	-	-	-	11	11
D.2 I&D materials	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	11	11
E. Training, extension & studies											
E.1 Training/extension	-	-	-	-	-	-	-	-	223	31	254
E.2 Surveys/studies	-	-	-	-	-	-	-	-	-	-	-
E.3 Water committees	-	-	-	-	-	-	-	92	24	-	116
Subtotal	-	-	-	-	-	-	-	92	247	31	370
F. Consulting services											
F.1 International	-	-	-	-	-	-	-	-	-	2,678	2,678
F.2 National	-	-	-	-	-	-	-	-	-	43	43
Subtotal	-	-	-	-	-	-	-	-	-	2,721	2,721
G. Project operations											
G.1 Office/staff costs	-	-	-	-	-	-	-	-	-	-	-
G.2 PMO and RO costs	7	17	-	9	7	-	-	-	-	81	121
Subtotal	7	17	-	9	7	-	-	-	-	81	121
Total	7,111	3,709	2,209	3,314	500	740	296	1,434	247	3,064	22,625

^a Excludes interest charges. I&D=irrigation and drainage, PMO=project management office, RO=regional office.

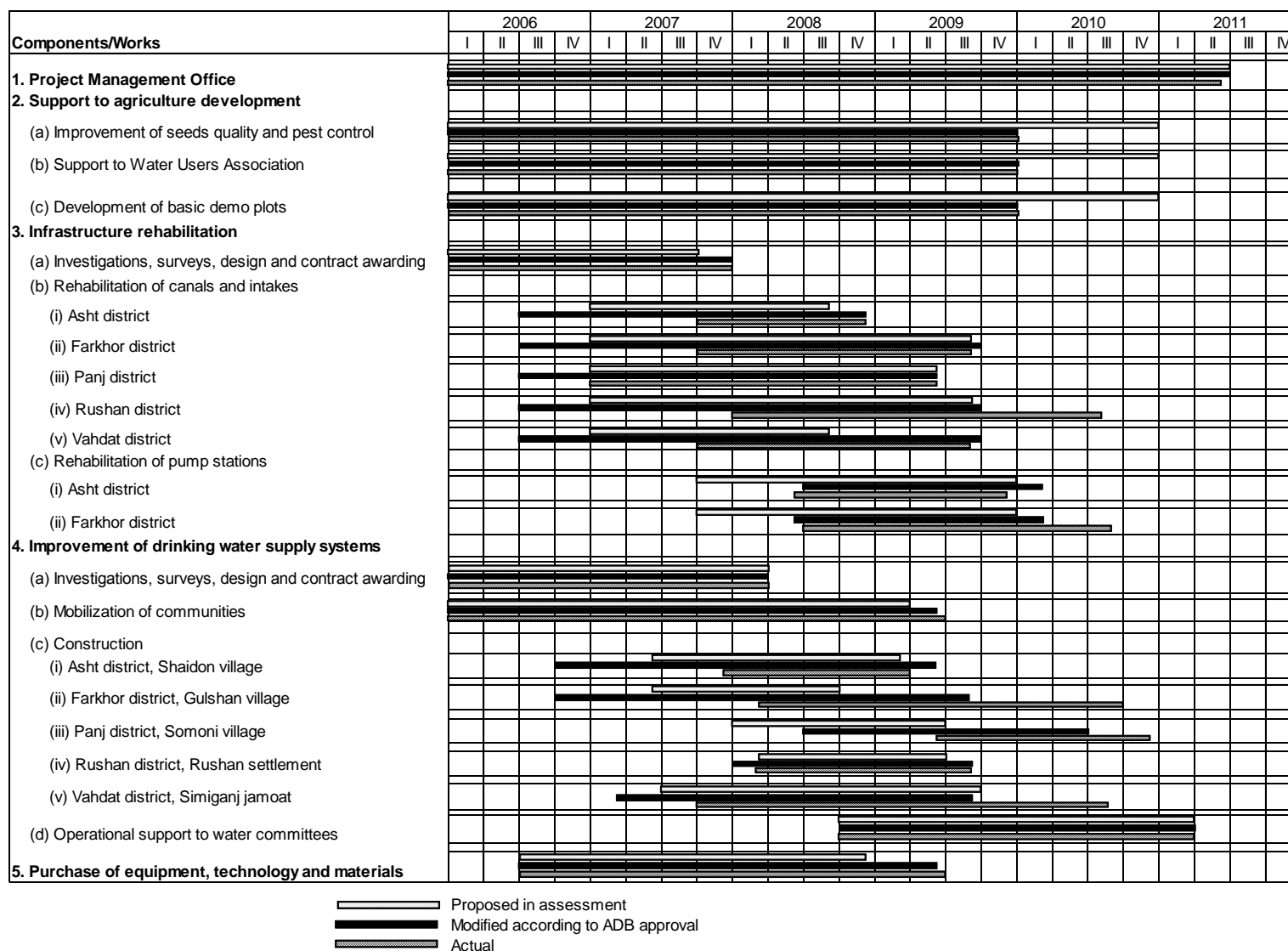
Source: Asian Development Bank.

Table A5.4: Project Disbursements by Category – Foreign and Local

(\$)				
No.	Category Title	Foreign Exchange	Local Currency	Total
01	Civil Works	1,450,240	6,559,151	8,009,391
02A	Equipment	11,222,181	-	11,222,181
02B	Vehicles	169,708	-	169,708
02C	Materials	11,162	275	11,437
03	Training, Extension & Studies	-	370,183	370,183
04A	Consulting Services - Foreign	2,678,318	-	2,678,318
04B	Consulting Services - Local	-	42,734	42,734
05	Office and Staff Costs	-	120,749	120,749
06	Interest Charge	616,508	-	616,508
Total		16,148,117	7,093,092	23,241,209

Source: Asian Development Bank.

PROJECT IMPLEMENTATION SCHEDULE



Source: Asian Development Bank.

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference	Status
Project Executing Agency and PMU MLRWR shall be the Project Executing Agency. The minister of MLRWR shall be the Project Director with overall responsibility for project implementation. A PMU shall be established within MLRWR to manage project activities under the leadership and supervision of MLRWR and to liaise with ADB and other coordinating bodies.	LA, Attachment 6, para. 1.	Complied. The government assigned the MLRWR as Executive Agency and the Project Director in December 2004. The PMU was established in September 2005.
Steering Committee A high-level steering committee established during the Project preparation stage shall continue to provide policy guidance and facilitate inter-ministerial coordination.	LA, Attachment 6, para. 2.	Complied. The committee was established on 25 August 2005 and met quarterly until 2009.
Regional Offices Five ROs of PMU shall be established, with the one for Vahdat operating in the PMU office premises in Dushanbe and the others being based in the respective sub-project areas. ROs shall be responsible for the Project implementation in their respective sub-project areas and for maintaining liaison with the PMU, local administration, and beneficiary organizations.	LA, Attachment 6, para. 3.	Complied. 4 regional offices (RO) were established in the project areas, while the Vahdat RO is located in the PMU office due to close proximity and cost efficiency.
Staffing of PMU and ROs The PMU shall be led by a full-time the PMU Manager and the ROs by the Regional Managers. The PMU Manager shall be nominated by the Borrower and endorsed by ADB. The Regional Managers and other key staff shall be selected on merit by a panel of experts appointed by the Borrower and agreed by ADB. Staff selected by the Panel shall need endorsement by ADB.	LA, Attachment 6, para. 4.	Complied. The PMU will be led by the director nominated by the Government of the Republic of Tajikistan and ADB endorsement. All full time, additional PMU and regional offices staff was selected and endorsed by ADB.
Monitoring and Evaluation Unit A monitoring and evaluation (M&E) unit shall be established within the PMU to implement the environmental monitoring system recommended in the Summary Initial Environmental Examination and to monitor the environmental, poverty, gender and other social impacts of the Project.	LA, Attachment 6, para. 5.	Complied. M&E unit was established and staffed by a specialist on social impact evaluation and a specialist on environmental monitoring and approved by ADB.
Specifically, the M&E unit shall be responsible for (i) collecting, collating, and analyzing baseline data relating to the economic, poverty, social, and environmental conditions disaggregated by	LA, Attachment 6, para. 6.	Complied. (i) Base line data collection was done and data base was established. (ii) Monitoring on the project implementation results was regularly

gender, income, and farm types within the Project area; (ii) benefit monitoring during the project implementation, and (iii) evaluating the Project's economic, poverty, gender, social, and environmental impacts within the selected systems. The M&E unit shall particularly monitor (i) income opportunities and other resources provided under the Project to extremely poor communities and women, (ii) reduction in vulnerability of households to waterborne diseases, and (iii) participation of women in the community activities. The M&E unit will have two staff members, who work with the responsible agencies.		conducted. (iii) monitoring of villagers employment in the construction sites was conducted: The following numbers of people temporarily employed during construction were: Asht district – 130, Vahdat – 95, Farkhor – 160, Pyanj – 105, and Rushan district – 30. Cotton crop in average increased to 11%, cereal crops – 21%, vegetables – 41% and other agro crops accordingly. (iv) no harm to flora, fauna and environment in project areas identified. (v) For a period of the project implementation a number of dekhan farms led by women increased to 40%, and a number of women involved to become WUA members reached no less than 33%.
To monitor the Project's social impact, during the first year of the Project implementation the M&E unit shall compile a benchmark database on basic economic and social conditions to provide a socioeconomic profile of the beneficiary communities.	LA, Attachment 6, para. 7.	Complied. During the first year of project implementation M&E unit specialists together with the consultants selected all initial data on basic economic and social conditions and socioeconomic profile of the beneficiaries' community had been prepared which was submitted in the consultant's report.
Mid-Term Review During the third year of the Project implementation, the Borrower and ADB shall carry out a midterm review to assess the achievement of the project objectives and implementation milestones.	LA, Attachment 6, para. 8.	Complied. ADB midterm review mission was carried out in May 1-7, 2008 to evaluate project implementation and major indicators.
Pre-Construction Works The Borrower shall ensure that desalting of the canals and drains within the Project schemes is carried out, and shall provide budgetary allocation to ensure that these works shall be completed before awarding the civil works contracts financed by the Loan.	LA, Attachment 6, para. 9.	Complied. Generally, before awarding the Contracts on civil works canals and drainages in the project scheme areas had been cleaned totaling TJS 1,000,000 at the expenses of GoT funds. At present embankment strengthening equipment purchased under the project are used for cleaning canals and drainages from silt in the Project implementation area.
Environment The Project shall be carried out, and all facilities constructed, operated, maintained, and monitored in accordance with the existing laws, regulations, and standards of the Borrower concerning environmental protection and ADB's Environment Policy	LA, Attachment 6, para. 10.	Complied. Existing laws, regulations and standards regarding environmental protection, as well as IEE recommendations and ADB policy were followed while carrying out surveys, researches and construction.

(2002). The Borrower shall ensure that MLRWR implements the environmental mitigation measures and monitoring requirements as outlined in the Initial Environmental Examination (IEE).		
The Borrower shall ensure that an appropriate budgetary allocation, including vehicles, materials, equipment, operating expenses and staff to be provided by MLRWR and the Borrower's State Committee of Nature Protection and Forestry to fulfill their responsibilities for implementation of mitigation measures and monitoring requirements as outlined in IEE.	LA, Attachment 6, para. 11.	Complied. Sufficient funds for the project implementation described in IEE to conduct mitigation measures and monitoring were annually allocated by the Republic of Tajikistan Government.
Resettlement The Borrower shall ensure that involuntary resettlement under the Project, if any, including loss of crops, land, other resources/assets is undertaken in conformity with a resettlement plan to be prepared by the Borrower in accordance with the <i>ADB's Policy on Involuntary Resettlement</i> . The compensation to the persons affected by the resettlement shall make them as well off as they would be in the absence of the Project and such compensation and the resettlement assistance shall be provided to the affected persons prior to their displacement and dispossession of land and houses. The Resettlement Plan shall be updated based on the detailed designs, and it shall be disclosed to all affected persons in a form and language that they can understand, and submitted by the EA's endorsement to ADB for review and approval before any civil work contracts are awarded.	LA, Attachment 6, para. 12.	Complied. No issues related to resettlement were raised while project development and implementation.
Social and Poverty Aspects Gender and Development The Borrower shall start an implementation of the Gender Action Plan outlined in the Summary Poverty Reduction and Social Strategy within one year of the Loan coming into effect. The Borrower shall ensure that (i) the female-headed farms in the Project areas are the WUA members and that women are fully represented in the project planning and implementation meetings; (ii) women will make up at least 30% of the local water supply committees; and (iii) women will participate in all activities in the Core Demonstration Plots and will be trained in new agricultural practices.	LA, Attachment 6, para. 13.	Complied. Number of women leading households in the project districts are as follows: Asht district - 6 persons, WUA members - 1188 persons; Vahdat district – 43 persons, WUA members – 705 persons; Pyanj district – 11 persons, WUA members - 2673 persons; Farkhor district – 26 persons, WUA members - 2524 persons; Rushan district - 9 persons, WUA members - 345 persons. Number of women comprised in local water supply committees is 33%. As the population in jamoats of pilot

		districts basically consists of women they certainly participated in all activities in core demo plots and were taught to use new agricultural methods.
Poverty Reduction To maximize employment and income-generating opportunities in the Project areas the Borrower shall and cause the contractors to agree to hire the poor and vulnerable groups from local villages for civil works to the maximum extent possible. Poor communities shall be supported by involving them in the food-for-work program pertaining to simple rehabilitation works. The local communities or other similar local groups shall be inquired to identify the target households.	LA, Attachment 6, para. 14.	Complied. Employment was provided to the specialists and workers among villagers basically by contractor organizations. A clause was included in each civil works contract to employ local people.
Operation and Maintenance Arrangements Operation and Maintenance (O&M), Water Service Fees, and Fee Collection in the Project Area The Borrower shall provide adequate budgetary allocation, including that needed to cover the transition period up to full cost recovery and collection of the irrigation service fees.	LA, Attachment 6, para. 15.	Not complied. The government annually allocates funds to MLRWR branch offices in the district level. Funds allocated do not meet full costs of maintenance. Irrigation service fees have been established, with differentials for pump versus service irrigation schemes. In practice a single price is used. Full cost recovery of irrigation service fees does not occur.
The Borrower will issue a resolution not later than December 31, 2007 to set differential irrigation service fees for lift and gravity irrigation schemes. These fees shall be increased gradually until they fully cover the cost of O&M of the irrigation facilities by December 31, 2010, in line with the Borrower's agreement with the International Bank for Reconstruction and Development.	LA, Attachment 6, para. 16.	Complied. On 14 June 2007 the Ministry of Economic Development and Trade (MEDT) issued Decree No.10 "Of water supply services from the government irrigation networks". According to the Decree differentiated fee was specified for water supply services from machinery and gravity irrigation schemes where a rate for 1m ³ water supply from gravity irrigation scheme was 0.78 dirams, but a rate for water supply from machinery irrigation scheme was 1.25 dirams. With the view of financing operation & maintenance for irrigation schemes on 19 May 2008 the Ministry of Economic Development issued Decree No. 17 "Of the rates for water supply from the state irrigation networks". According to this Decree new rates for water supply from the machinery and gravity

		irrigation schemes where the rate for 1m ³ water supply from gravity irrigation scheme was 1.5 dirams, but for water supply from machinery irrigation scheme was 2.39 dirams.
The Borrower shall formulate with assistance of the Project a potable water supply cost recovery and fee structure based on assessment of affordability especially of poor farm households and not later than December 31, 2008 should implement such policy.	LA, Attachment 6, para. 17.	Complied. A potable water supply cost recovery and fee structure (CRFS) in each district was established in each district. The CRFS is based upon an estimate of the O&M cost and is submitted to the Antimonopoly Committee for approval.
Water User Associations and Water Supply Committees in the Project Area Within three years of Loan Effectivity the Borrower shall ensure that WUAs and WCs are established in the Project area, not precluding the utilization of other external donor assistance for this purpose.	LA, Attachment 6, para. 18.	Complied. During project implementation it was planned that there 25 WUAs would be established. At present 28 WUAs had been already established and registered (6 in Asht district, 5 in Vahdat district, 7 in Farkhor district, 5 in Pyanj district and 2 in Rushan district, and 3 in Hamadoni district). All established WUAs were equipped with computers and furniture. In addition, 5 Water Committees were established.
The Borrower shall ensure that the WUAs shall assume the responsibilities to carry out the O&M of the on-farm irrigation and drainage facilities after they are fully organized and trained, but not later than 2 years after rehabilitation of their infrastructure is completed.	LA, Attachment 6, para. 19.	Complied. WUAs are responsible for collection of irrigation service fees and conducting O&M. Effectiveness for full O&M is constrained by collection rates for irrigation service fees not meeting full cost recovery.
Sector Policy and Reforms: Cotton Financing and Marketing in the Project Area The Borrower shall ensure that Presidential Decree No 899 of September 23, 2002 be strictly implemented by the regional and district level administrations in the Project area to abolish planning target for cotton production, which sets both the area of farm land for producing cotton and the quantity of fiber to be produced.	LA, Attachment 6, para. 20.	Complied. Under the Republic of Tajikistan Government Decree dated 30 May 2009 "Of additional measures to support agriculture in the Republic of Tajikistan" cotton and other crops production planning system was generally canceled.
Not later than December 31, 2006, the Borrower shall, in consultation with ADB, develop and implement mechanism to ensure that (a) the farm-gate prices for raw cotton shall be linked to the world prices for cotton fiber; (b) the fixed export price for cotton fiber shall be changed from a maximum to a minimum price; and (c) these	LA, Attachment 6, para. 21.	Complied. A Joint Regulation by the Ministry of Economic Development and Trade and Agriculture Ministry dated 15 March 2007 "Procedure of calculation of releasing and marginal sizes of transportation and realization expenses related to selling of cotton"

prices shall be published/made available to the public.		established a methodology for calculating cotton prices. A resulting Government decree was introduced on 5 March 2008 to base cotton prices on Liverpool exchange price. Tajikistan cotton prices are now directly linked to world prices.
Not later than December 31, 2006, the Borrower shall ensure that, in compliance with Presidential Decree 899 dated September 23, 2002 and Resolution No. 421 dated October 22, 1999, the regional and district level administrations in the Project area shall (a) permit financing by the multiple cotton investors; (b) ensure that the ginning services are not restricted by the administrative boundaries; and (c) permit the movement of raw cotton across the administrative boundaries for ginning and marketing.	LA, Attachment 6, para. 22.	Complied. The President Decree of 30 May 2009 "Of additional measures to support agriculture in the Republic of Tajikistan" waived the debts accrued by cotton farmers. This broke the relationship between farmers and investors for provision of inputs. Farmers are now reliant on own funds or borrowings from banks and MFIs for input purchases, and to a much less extent on investors. In addition, all transactions with investors are now on a cash only basis.
The Borrower shall, with the assistance of the TA Consultants for Support to Monitoring Policy Reforms and Improving Farm and Water Management, develop standard cotton financing and production contracts to ensure introduction of financial disciplines and appropriate allocation of rights, benefits, responsibilities and risks among the concerned parties. Not later than December 31, 2006, the Borrower shall submit such draft standard contracts for ADB's review and after ADB's approval, implement these contracts in the Project areas.	LA, Attachment 6, para. 23.	Complied. A template prepared as part of TA 4664-TAJ was adopted by the government as part of the President Decree of 30 May 2009.
Agricultural Support Services With the assistance provided under the Project, the Borrower shall develop, not later than December 31, 2006, a farm support service plan and implement measures to improve farm productivity and profitability, through (a) dissemination of market information; (b) provision of farm support services to improve farming technology and crop diversification; and (c) increase of crop value through the improved marketing, processing, and adoption of international standards for cotton grading. The Borrower shall jointly review with ADB on an annual basis the availability and quality of farm support services.	LA, Attachment 6, para. 24.	Complied. Contract was signed with TAAS and all needed actions were taken to support dekhani farms. In the Project Implementation districts in demo plots seminars and trainings were held by the science institutions' staff with wide participation of dekhani farm heads and farmers with a number of 753 persons.
The Borrower shall ensure that the planned and existing farm support services,	LA, Attachment 6, para. 25.	Complied. PMU and Consultant interacted with

particularly farm machinery (through its assistance program provided by the Japanese Government) are made available to the private farms in the Project area within one year of Loan affectivity.		other projects implementing these tasks in cooperation with the governmental entities.
<p>The Borrower shall, not later than December 31, 2006, develop detailed and transparent procedures acceptable to ADB to implement the Borrower's Resolution No. 522 of 1996 "Procedure of Reorganization of Farms and Agricultural Enterprises", to ensure that in the Project areas:</p> <p>(a) Farmers be allowed to choose which reorganized farm they become members/shareholders of, and able to elect their own farm managers who shall be accountable to the members/shareholders;</p>	LA, Attachment 6, para. 26 (a).	<p>Complied.</p> <p>Reorganization mechanism was developed under the land registration and cadastre system for sustainable agriculture project. So far 39,000 dekhani farms have been established.</p> <p>The land reform process resulted in creation of 39,000 from reorganization of 662 former kolkhozes and sovkhozes. At present dekhani farms efficiently use 4,627,737 hectares of land out of which 496,223 hectares of land are arable, and 799,820 hectares of dekhani farms have received their land shares.</p> <p>(a) Farmers were given a right of to be a member/stakeholder for any farm they want and select its farm leader who will be directly accountable to members/stakeholders.</p>
<p>(b) individual farmers/families be issued long term (30 years) certificates of land use rights upon request, and the sub-certificates issued to individual members of a collective dekhani farms shall carry the same legal rights as the certificates;</p> <p>(c) transparent process be set up to obtain land use rights for any individual farmer or farmer family independent of the collective dekhani farms of which they are members;</p>	<p>LA, Attachment 6, para. 26 (b).</p> <p>LA, Attachment 6, para. 26 (c).</p>	<p>Complied.</p> <p>(b) According to Article 241 of the RT Civil Code land use certificates are issued with "the right of inherent life tenure" to separate farms/families. Kolkhozes no longer exist in Tajikistan.</p> <p>(c) According to Article 23 of the Republic of Tajikistan Land Code No. 357 dated January 5, 2008 regulations on acquisition of equal land use right now apply for any individual person or family regardless whether they are dekhani farm's members or not.</p>
(d) such individual farmers or farmer families be treated equally as other members of the collective dekhani farms in terms of proportion of debt burden associated with the land to be transferred to them, the land quality, geographic location, and access to irrigation services and other elements affecting farming activities.	LA, Attachment 6, para. 26 (d).	<p>Complied.</p> <p>(d) The Farm Debt Resolution was implemented in the framework of the Republic of Tajikistan Government Decree dated 30 May 2009 "Of additional measures to support agriculture in the Republic of Tajikistan", and in accordance with it all cotton farm debts as of January 1, 2008 are abolished.</p>

<p>The Borrower shall prepare amendments to the existing land laws to allow the land use rights certificates held by farmers to be used as collateral for obtaining financing and submit the amendments to its Parliament for adoption not later than December 31, 2007.</p>	<p>LA, Attachment 6, para. 27.</p>	<p>Complied. Documents giving to farmers rights to apply the land use certificates as a pledge to get credits were accepted by the Government. This mechanism's legal base is being improved.</p>
<p>Procurement Procurement of goods and services shall be made without any restriction against or preference for any particular supplier or contractor or any particular class of suppliers or contractors, except as otherwise provided in the paragraphs 6, 7 and 8 below.</p>	<p>LA, Attachment 4, para. 3.</p>	<p>Complied. All procurement are completed pursuant to the ADB procedures and recommendations reflected in the Memorandum on the Project Management and signed by the Government and ADB.</p>
<p>Force account Implementation of targeted works by assistance of its own labor force. Each of those works the size, nature or location of which makes them unsuitable for competitive bidding, estimated to cost the equivalent of not more than \$ 50,000 may be carried out by MLRWR under the procedure of using its own labor force.</p>	<p>LA, Attachment 4, para. 8.</p>	<p>Complied. All targeted works were carried out by assistance of local labor force during the Project implementation first.</p>
<p>Consultants The services of consultants shall be used while carrying out the Project, particularly with regard to:</p> <ul style="list-style-type: none"> (i) institutional capacity building; (ii) design, preparation of bidding documents, bid evaluation, and construction supervision; (iii) agricultural support services; and (iv) project management, monitoring, and evaluation. <p>The terms of reference for the consultants shall be as determined by agreement between ADB and the Borrower.</p>	<p>LA, Attachment 5, para. 1.</p>	<p>Complied.</p>
<p>The selection, engagement and services of the consultants shall be subject to the provisions of this Schedule and the provisions of the "Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers" issued in April 2002 (hereinafter called the "Guidelines on the Use of Consultants"), as amended from time</p>	<p>LA, Attachment 5, para. 2.</p>	<p>Complied.</p>

to time, which have been furnished to the Borrower.		
Selection and engagement of the consultants shall be made without any restriction against or preference for any particular consultants or any particular class of consultants.	LA, Attachment 5, para. 3.	Complied. Selection and engagement of the consultants for IRP – BETS-CES Association in accordance with "Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers" and approved by ADB.
In the period of the Project implementation and operation of the Project facilities, the Borrower shall perform or cause to be performed, all obligations set forth in Schedule 6 to this Loan Agreement.	LA, Article IV, Section 4.01.	Complied.
<p>In the period of the Project implementation and operation of the Project facilities, the Borrower shall perform or cause to be performed all obligations set forth in Schedule 6 to this Loan Agreement.</p> <p>The Borrower shall (i) maintain or cause to be maintained, separate accounts for the Project; (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; (iii) furnish to ADB, as soon as available but in any event not later than six (6) months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of this Loan Agreement as well as on the use of the procedures for imprest account/statement of expenditures), all in the English language; and (iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.</p>	LA, Article IV, Section 4.02(a).	<p>Complied.</p> <p>A new Contract with "Grant Thornton Amyot" LLC (Armenia) Independent Audit Company in June 2010 was signed to conduct audit for past 2009 which was conducted in July 2010. Auditors gave positive conclusion that was sent to ADB.</p>
The Borrower shall enable ADB upon ADB's request, to discuss the Borrower's financial statements for the Project and its financial affairs related to the Project from time to time with the Borrower's auditors, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB, provided	LA, Article IV, Section 4.02 (b).	Complied.

that any such discussion shall be conducted only in the presence of an authorized officer of the Borrower unless the Borrower shall otherwise agree.		
Without limiting the generality of Section 6.05 (a) of the Loan Regulations, the Borrower shall furnish or cause to be furnished, in ADB quarterly reports on the carrying out of the Project and on the operation and management of the Project facilities.	LA, Article IV, Section 4.03.	Complied.
The Borrower shall enable ADB's representatives to inspect the Project, the goods financed out of the Loan proceeds, and any relevant records and documents.	LA, Article IV, Section 4.04.	Complied.
The following is specified as an additional condition to the effectiveness of this Loan Agreement for the purposes of Section 9.01(f) of the Loan Regulations: a Resolution on establishing PMU, including appointment of the PMU Manager and provision of the offices and facilities therefore, shall have been issued by the Borrower.	LA, Article V, Section 5.01.	Complied.

CONSULTANT INPUTS

	Allocation (person-months)	Actual use (person-months)
International Consultants:		
Dr. Rejai Karim (Team Leader)	27.0	27.0
Dr. Matiar Rahman Khan (Procurement/Contract specialist)	12.0	12.0
Mithilesh Kumar (Hydraulic-engineer/Design Team Leader)	8.0	8.0
Tarek Bin Hossain (River Morphologist)	1.0	1.0
Anwar Haider (Land Surveyor)	2.0	2.0
A. Q. Mohammad Ali (Geotechnical and Embankment Specialist)	3.0	3.0
S. K. Srivastava (Mechanical Engineer (gates))	1.0	1.0
Abdur Rab Khan (Mechanical Engineer (Irrigation pumps))	2.0	2.0
ASM Mosharraf (Electrical Engineer (Irrigation pumps))	2.0	2.0
Dr. P. K. Das (Social Impact Assessment Expert)	2.0	2.0
Dr. AKM Aminullah Bhuiyan (Fisheries Specialist)	1.0	1.0
Md. Mohammad Rahman Mizanur (Community Water Supply Design Engineer)	8.0	8.0
Dr. S. Singh (WUA/Institutional Development Consultant (Senior))	3.0	3.0
Md. Mizanur Rahman (Financial Database Management Expert)	2.0	2.0
Dr. S. Rajakutty (M&E and MIS Specialist)	1.5	1.5
Dr. Abu Murshid (Environmental Monitoring Specialist)	1.5	1.5
Md. Nazrul Islam (Irrigation Water Management Consultant)	3.0	3.0
Dr. A. Latif (Environmental Specialist)	1.0	1.0
Dr. Shaker (Economist)	1.0	1.0
Subtotal	82.0	82.0
National Consultants:		
Deputy Team Leader/Irrigation Expert	49.0	47.9
Design Team Leader/Hydrologist	40.0	43.8
River Morphologist	4.0	4.0
Technical Structures Specialist	10.0	10.0
Mechanical Engineer (Gates)	9.4	12.4
Mechanical Engineer (Irrigation pumps)	24.0	29.0
Electrical Engineer	35.5	34.4
The 1 st Construction Supervision Consultant in M. Hamadoni	8.8	8.8
The 2 nd Construction Supervision Consultant in M. Hamadoni	8.7	8.7
Irrigation Water Management Expert	30.0	36.0
WUA Consultant (Senior)	25.0	25.0
WUA Consultant	22.0	23.8
Public Participation Specialist	8.0	8.0
Water Supply Engineer	26.0	26.0
Groundwater Hydrogeologist	6.0	6.0
Geotechnical and Embankment Specialist	8.0	8.0
Community Participation Specialist	13.0	13.0
Irrigation Agronomist	16.0	16.0
Irrigated Pests Management Specialist	10.0	10.0
Social Impact Assessment Expert	8.0	20.5
Gender and Social Development Expert	9.0	9.0
Land Surveyor	2.5	2.5
Financial Database Management Expert	4.0	1.7

M&E and MIS Specialist	17.0	20.4
Environmental Monitoring Specialist	6.0	4.7
Construction Supervision Consultant (Pyanj)	27.0	26.7
Construction Supervision Consultant (Vahdat)	27.0	25.4
Construction Supervision Consultant (Farchor)	31.0	31.0
Construction Supervision Consultant (Asht)	17.0	16.2
Construction Supervision Consultant (ASHT-1)	18.0	16.1
Construction Supervision Consultant (Rushan)	14.7	14.7
The 1 st Construction Management Specialist	19.0	16.5
The 2 nd Construction Management Specialist	19.0	15.0
Procurement and Contract Specialist	20.0	7.0
Lawyer	19.0	13.5
Seeds Specialist	5.4	5.4
Construction Materials Specialist	1.0	1.0
Subtotal	618.0	618.0
Total	700.0	700.0

Source: Asian Development Bank.

PROJECT ECONOMIC REEVALUATION

A. Introduction

1. The project appraisal and approval presented two economic analyses, one for the outputs related to irrigation and agricultural outputs and a separate analysis for five water supply investments. This reevaluation retains this separation. The change in scope to include the Hamadoni District Pyanj river protection works were not assessed at the time of the change in scope and has been excluded from this reevaluation. The reevaluation draws on the government project completion report, project monitoring and evaluation outputs and field visits to all districts except Rushan.

B. Irrigation and Agriculture Reevaluation

1. Methodology and Assumptions

2. An economic reevaluation was completed with the objective of comparing the economic internal rate of return (EIRR) at project completion with that estimated at appraisal. The comparative analysis is incomplete due to the lack of data at project completion with the project management office (PMO) failing to undertake a project completion monitoring survey to update the baseline study. The government project completion report presents aggregate, often district level, data with no temporal and spatial distribution of project impacts by irrigation command or sub-command areas, by farm type and size, and by beneficiary status – gender and wealth rank. The scope of the reevaluation is limited to district level irrigation system analysis. Data on the agricultural demonstration and extension initiatives is minimal with the Tajikistan Academy of Agricultural Science unable to provide the project completion review mission with access to the staff who completed the work or their records.

3. The reevaluation is based on the incremental trading margins for benefits resulting from (i) increased productivity of agricultural crops from improved water delivery, (ii) crop diversification arising from increased availability and certainty of water supply, (iii) expansion of irrigated areas through reconnecting command areas, and (iv) an increase in cropping intensity. The reevaluation estimates increased gross margins for cotton, wheat, vegetables, fodder, orchards and others (a mix of vegetables) using with-project less without-project assumptions. Capital not linked to the subproject was excluded at the subproject level but included within an aggregate estimate of the irrigation and agriculture investment. The trading margins are aggregated according to the physical scope achievements (Table A9.1). The aggregated benefits are then offset against the project management investment, water management services and the agricultural demonstration costs.

Table A9.1: Irrigated Areas With- and Without-Project (ha)

	Before-Project			With-Project			Without-Project		
	Rainfed	Irrigated	Total	Rainfed	Irrigated	Total	Pump	Gravity	Total
Asht	5,820	7,940	13,760	-	15,520	15,520	4,830	8,320	13,150
Vahdat	3,800	3,700	7,500	-	7,500	7,500	3,800	3,700	7,500
Farkhor	1,182	17,232	18,414	-	18,414	18,414	1,182	17,232	18,414
Pyanj	1,710	14,895	16,605	-	16,605	16,605	1,709	14,895	16,604
Rushan		1,270	1,270	-	1,270	1,270		1,270	1,270
Total	12,512	45,037	57,549	-	59,309	59,309	11,521	45,417	56,938

Note: Irrigated areas differ from command areas due to either intercropping (Asht) or increased cropping intensity.

Source: The Project completion report prepared by the Government of Tajikistan.

4. While the areas reported in Table A9.1 are indicated as benefitting in the appraisal and government's project completion report, large areas of Asht, Pyanj, and Farhkor irrigation systems only receive indirect benefit from increased water distribution linked to work on part of the head works or distribution canal rehabilitation (Table A9.2). No measurement of project impact or benefits on these indirect benefit areas were made during implementation or on completion. For the reevaluation, yield responses in these indirect benefit areas are reduced for benefit estimation and due to claims that investment was still required to rehabilitate other parts of the irrigation system to increase productivity.

Table A9.2: Direct and Indirect Project Areas (ha)

District	Direct	Indirect	Total
Asht	7,300	8,220	15,520
Vahdat	7,500	-	7,500
Farkhor	3,914	14,500	18,414
Pyanj	3,360	13,245	16,605
Rushan	-	1,270	1,270
Total	22,074	37,235	59,309

Source: Asian Development Bank estimates.

5. All costs and benefits are expressed in late 2011 Tajikistan somoni (TJS) in a domestic price numeraire. A shadow exchange rate factor of 1.11 was applied to convert foreign costs at the border to domestic prices. Investment costs of tradable goods have been adjusted to constant 2011 values using the manufactures unit value index published by the World Bank and non-tradable costs by the Tajikistan consumer price index. Table A9.3 show the indices used.

Table A9.3: Conversion Indices

	MUV Index	CPI	Exchange Rate TJS/\$	Shadow Exchange Rate Factor	Shadow Wage Rate Factor
2005	100.0	154.8	3.12	-	-
2006	103.2	165.9	3.30	-	-
2007	106.2	186.6	3.44	-	-
2008	109.7	223.7	4.43	-	-
2009	111.0	250.1	4.14	-	-
2010	112.7	262.7	4.38	-	-
2011	114.8	286.4	4.61	1.11	0.85

CPI = consumer price index, MUV = manufactures unit value.

Source: Asian Development Bank estimates.

6. Financial prices are converted to economic prices by (i) deducting duties and taxes and financial charges from investment costs, (ii) assuming no residual value for civil works and equipment, (iii) converting foreign currency costs at a conversion factor of 1, and (iv) converting local currency costs at a conversion factor of 0.95 (it is assumed that 75% of local costs are non-labor costs with a conversion factor of 1, and 25% of the local currency costs are local unskilled labor at a conversion factor of 0.85). An exchange rate of TJS 4.61 = \$1 has been used to convert constant dollar values into their local currency equivalents. A 25-year project life period is used to cover the economic life of infrastructure and pumps. The project investments and their conversion from financial to economic prices are presented in Table A9.4.

2. Prices

7. The project's quantified incremental outputs comprise yield increases from (i) rainfed cotton, wheat, orchards, vegetables that are converted to irrigated crops, (ii) increased yields from increased water supply during periods of high water demand and through increased pumping capacity during the irrigation season, (iii) crop diversification through movement to higher value crops, and (iv) increased cropping intensity, especially from increased vegetable production under orchard trees. Prices for local traded products were sourced from the PMO monitoring and evaluation team and from field interviews.

8. Border prices were calculated for the major traded crops of cotton and wheat (Tables A9.5 and A9.6) and import parity prices were calculated for nitrogen, phosphate and potash (Tables A9.7 and A9.8). The increase in global commodity prices in 2009 to 2011 more than doubled the returns from cotton but are forecast to decline. Wheat prices also increased but are forecast to decline. The higher commodity prices have significantly improved producer returns and the incentives to change production systems in both with-project and without-project scenarios.

3. Quantified Incremental Outputs

9. Agricultural production changed significantly during project implementation. Over the five districts, the area of wheat declined while vegetable and cotton areas increased. Many of these changes also occurred in non-project areas reflecting rapid changes in commodity prices with international cotton prices reaching a historical high in 2010-11, an increase passed onto producers due to the required policy reforms. The higher prices resulted in a switch from wheat to cotton in every district. The project resulted in an increase in vegetable production in Vahdat due to its proximity to high value markets in Dushanbe, and Asht where increased water supply enabled under-story cropping in orchards (Table A9.9).

10. At appraisal cropping intensities were predicted to increase by 3% to 5%. The government project completion report indicated increased cropping intensities, however, this was based on district level statistics and not data from project beneficiaries. The inability to separate project impacts from wider sector trends relating to cropping intensity due to the lack of a project completion survey was a significant gap and oversight. Field visit discussions indicated that cropping intensity increased but was of a similar magnitude to wider district trends and, therefore, no increase in cropping intensities for the with-project scenario relative to the without-project was included. The exception was for Asht where cropping intensity increased as a direct result of the project enabling under-story cropping with vegetables in orchards at higher elevations.

11. Crop productivity by district (Table A9.10) increased for with-project and without-project impact areas in the five districts. Within the project areas yields increased at slightly higher rates. Notable exceptions are in Asht where under a without-project scenario yields continued to decline as additional pump failures or pumping efficiency losses continued, and for Rushan where command areas are small and increasingly cut-off with failing distribution systems.

Table A9.4: Project Cost - Economic Prices

	Unit	2005	2006	2007	2008	2009	2010	2011
ADB capital expenditure	\$	100,000	866,443	5,808,060	6,073,271	7,539,323	1,942,717	294,888
Govt capital expenditure	\$	24,000	207,946	1,393,934	1,457,585	1,809,438	466,252	70,773
Total capital expenditure	\$	124,000	1,074,389	7,201,994	7,530,856	9,348,761	2,408,970	365,661
Foreign exchange component ^a	\$	47,120	408,268	2,736,758	2,861,725	3,552,529	915,408	138,951
MUV ^b index		100	103.2	106.2	108.6	109.7	111	112.7
Real foreign exchange (2011)	\$	53,104	445,851	2,904,262	2,969,765	3,649,681	929,428	138,951
Exchange rate		3.12	3.3	3.44	3.43	4.14	4.38	4.61
Real foreign exchange (2011)	TJS	165,685	1,471,307	9,990,660	10,186,293	15,109,680	4,070,896	640,566
Real foreign exchange (A)	TJS	183,911	1,633,150	11,089,633	11,306,785	16,771,745	4,518,694	711,028
Local currency	TJS	52,880	458,175	3,071,302	3,211,546	3,986,794	1,027,309	155,937
Local cost less tax	TJS	51,505	446,262	2,991,448	3,128,045	3,883,138	1,000,599	151,883
Local cost	TJS	160,696	1,472,666	10,290,581	10,729,196	16,076,189	4,382,623	700,178
Consumer price index		154.8	165.9	186.6	223.7	250.1	262.7	286.38
Real local costs (2011)	TJS	297,232	2,542,759	15,792,383	13,738,552	18,411,914	4,776,949	700,178
Real local economic costs (2011) (B)	TJS	282,370	2,415,621	15,002,764	13,051,624	17,491,318	4,538,102	665,169
Total economic costs (2011) (A+B)	TJS	466,281	4,048,771	26,092,397	24,358,409	34,263,064	9,056,796	1,376,197

^a foreign exchange comprises 38%; ^b MUV = manufactures unit value.

Table A9.5: Export Parity Price (Cotton)

Item		Unit	2006	2007	2008	2009	2010	2011	2012	2015
World price constant (2005)		\$/ton	1,240	1,285	1,344	1,264	2,022	2,705	1,730	1,690
MUV adjustment factor	1.145									
World price constant (2011)		\$/mt	1,420	1,471	1,539	1,447	2,315	3,098	1,981	1,935
Quality adjustment factor			92%	92%	92%	92%	92%	92%	92%	92%
Projected price for Tajikistan product		\$/ton	1,306	1,354	1,416	1,331	2,130	2,850	1,822	1,780
International freight and insurance		\$/ton	351	351	351	351	351	351	351	351
FOB price, Tajikistan border		\$/ton	955	1,002	1,065	980	1,779	2,499	1,471	1,429
Financial Prices										
Less handling costs and intermediaries' margins	2.5%		33	34	35	33	53	71	46	45
Cotton fiber price at cotton ginnery's gate		\$/ton	922	969	1,029	947	1,726	2,428	1,426	1,385
Less ginning costs and ginnery's margin	223	\$/ton	-223	-223	-223	-223	-223	-223	-223	-223
Net of ginnery Costs		\$/ton	1,145	1,192	1,252	1,170	1,949	2,651	1,649	1,608
Conversion from fiber to seed cotton	33%	\$/ton	344	358	376	351	585	796	495	483
By-products - linters per ton of seed cotton	3%	\$/ton	5	5	6	5	9	12	7	7
By-products - cotton seeds per ton of seed cotton	54%	\$/ton	22	22	22	22	22	22	22	22
Financial farm gate seed cotton		\$/ton	371	385	404	379	616	830	525	512
Financial farm gate seed cotton (local currency)	4.61	TJS/ton	1,712	1,777	1,862	1,747	2,841	3,828	2,419	2,361
Economic Prices										
Adjusted border price (adjusted by SERF)	1.11		1,060	1,113	1,182	1,088	1,974	2,774	1,633	1,586
Less handling costs and intermediaries' margins		\$/ton	33	34	35	33	53	71	46	45
Cotton fiber price at cotton ginnery's gate		\$/ton	1,027	1,079	1,146	1,055	1,921	2,703	1,587	1,542
Less ginning costs and ginnery's margin		\$/ton	-223	-223	-223	-223	-223	-223	-223	-223
Net of ginnery costs		\$/ton	804	856	923	832	1,698	2,480	1,364	1,319
Conversion from fiber to seed cotton		\$/ton	265	282	305	275	560	818	450	435
By-products - linters per ton of seed cotton		\$/ton	5	5	6	5	9	12	7	7
By-products - cotton seeds per ton of seed cotton		\$/ton	22	22	22	22	22	22	22	22
Economic farm gate seed cotton		\$/ton	293	310	333	302	591	853	480	465
Economic farm gate seed cotton	4.61	TJS/ton	1,350	1,429	1,533	1,392	2,727	3,930	2,213	2,142

FOB = free on board, MUV = manufactures unit value, SERF = shadow exchange rate factor.

Table A9.6: Export Parity Price (Wheat)

		Unit	2006	2007	2008	2009	2010	2011	2012	2015
FOB, port of origin ^a (2005 constant)		\$/ton	156	220	232	170	203	232	226	205
MUV multiplier		1.1450								
FOB, port of origin ^b (2011 constant)		\$/ton	178	252	266	195	233	266	259	235
Freight & insurance to St. Petersburg, Russia		\$/ton	30	30	30	30	30	30	30	30
CIF price at St. Petersburg, Russia		\$/ton	208	282	296	225	263	296	289	265
Port handling charges and storage costs at St. Petersburg		\$/ton	7	7	7	7	7	7	7	7
Transport, loading, unloading and insurance costs to Moscow		\$/ton	29	29	29	29	29	29	29	29
Landed price of American wheat in Moscow		\$/ton	243	317	331	260	298	331	324	300
Less quality adjustment for Kazakhstan's wheat ^c	15.0%	\$/ton	-36	-47	-50	-39	-45	-50	-49	-45
Kazakhstan's wheat - average grades, in Moscow Region		\$/ton	207	269	281	221	253	281	275	255
Less transport, handling and insurance: Kazakhstan – Moscow		\$/ton	52	52	52	52	52	52	52	52
Kazakhstan export parity border price ^d		\$/ton	259	321	333	273	305	333	327	307
Transport, handling and insurance to Tajikistan ^e		\$/ton	33	33	33	33	33	33	33	33
Landed price of wheat at Tajikistan's border		\$/ton	292	354	366	306	338	366	360	340
Financial Prices										
Importer's costs, handling and margin	10%	\$/ton	29	35	37	31	34	37	36	34
Wholesale price, equivalent to price at elevators		\$/ton	321	390	403	336	372	403	396	374
Storage, losses and drying costs	7.5%	\$/ton	-24	-29	-30	-25	-28	-30	-30	-28
Less transport, loading and unloading -- farms to elevators ^f		\$/ton	27	27	27	27	27	27	27	27
Financial import parity farm gate price		\$/ton	324	387	399	338	371	400	394	373
Financial import parity farm gate price - local currency	4.61	TJS/ton	1,493	1,786	1,841	1,559	1,711	1,843	1,814	1,718
Economic Prices										
Adjusted border price (adjusted by SERF)	1.11	\$/ton	324	393	406	339	375	407	400	377
Importer's costs, handling and margin		\$/ton	29	35	37	31	34	37	36	34
Wholesale price, equivalent to price at elevators		\$/ton	353	428	443	370	409	443	436	411
Storage, losses and drying costs		\$/ton	(24)	(29)	(30)	(25)	(28)	(30)	(30)	(28)
Less transport, loading and unloading -- farms to elevators		\$/ton	27	27	27	27	27	27	27	27
Economic import parity farm gate price		\$/ton	356	426	440	372	408	440	433	410
Economic import parity farm gate price	4.61	TJS/ton	1,641	1,965	2,027	1,714	1,882	2,029	1,997	1,890

CIF = cost, insurance and freight, FOB = free on board, MUV = manufactures unit value, SERF = shadow exchange rate factor.

^a = Urea (46% N), bagged, varying origins, FOB Eastern Europe. Source: Global Economic Prospects, World Bank, 2004; ^b = using the MUV multiplier;

^c = Kiev to Dushanbe; ^d = an average distance of 100 kilometers.

Table A9.7: Import Parity Price (Phosphate)

		Unit	2006	2007	2008	2009	2010	2011	2012	2015
FOB, port of origin ^a (2005 constant)		\$/ton	197	312	751	235	338	438	362	324
MUV multiplier		1.1450								
FOB, port of origin ^b (2011 constant)		\$/ton	226	358	860	270	387	501	414	371
Freight & insurance to port, plus unloading		\$/ton	25	25	25	25	25	25	25	25
Freight & insurance, overland to Tajikistan		\$/ton	100	100	100	100	100	100	100	100
Landed price, at Tajikistan's border		\$/ton	351	483	985	395	512	626	539	496
Financial Prices										
Handling, bagging, storage and losses	2.0%	\$/ton	7	10	20	8	10	13	11	10
Wholesale importer's margin	2.0%	\$/ton	7	10	20	8	10	13	11	10
Importers' wholesale price		\$/ton	365	502	1,024	410	533	651	561	516
Transport, loading and unloading to retail market ^c		\$/ton	13	13	13	13	13	13	13	13
Retailers' margin	2.0%	\$/ton	8	10	21	8	11	13	11	11
Import parity farm gate price		\$/ton	385	525	1,058	432	557	677	585	539
Nutrient content			46%	46%	46%	46%	46%	46%	46%	46%
Financial farm gate price of Phosphate nutrient		\$/ton	838	1,141	2,300	939	1,210	1,472	1,273	1,172
Financial farm gate price per kg of Phosphate nutrient		\$/kg	0.84	1.14	2.30	0.94	1.21	1.47	1.27	1.17
Financial farm gate price in local currency	4.61	TJS/kg	3.86	5.26	10.60	4.33	5.58	6.79	5.87	5.40
Economic Prices										
Adjusted border price (adjusted by SERF)	1.11	\$/ton	390	536	1,093	438	569	695	599	551
Handling, bagging, storage and losses		\$/ton	7	10	20	8	10	13	11	10
Wholesale importer's margin		\$/ton	7	10	20	8	10	13	11	10
Importers' wholesale price		\$/ton	404	555	1,133	454	589	720	620	570
Transport, loading and unloading to retailers ^c		\$/ton	14	14	14	14	14	14	14	14
Retailers' margin		\$/ton	8	10	21	8	11	13	11	11
farm gate price		\$/ton	425	579	1,168	476	614	747	646	595
Economic farm gate price of Phosphate nutrient		\$/ton	925	1,260	2,538	1,036	1,335	1,625	1,405	1,294
Economic farm gate price per kg of Phosphate nutrient		\$/kg	0.92	1.26	2.54	1.04	1.34	1.62	1.40	1.29
Economic farm gate price in local currency	4.61	TJS/kg	4.26	5.81	11.70	4.77	6.15	7.49	6.47	5.96

FOB = free on board, MUV = manufactures unit value, SERF = shadow exchange rate factor.

^a = Urea (46% N), bagged, varying origins, FOB Eastern Europe (Source: Global Economic Prospects, World Bank, 2004); ^b = using the MUV multiplier; ^c = Kiev to Dushanbe.

Table A9.8: Import Parity Price (Nitrogen)

		Unit	2006	2007	2008	2009	2010	2011	2012	2015
Urea, Eastern Europe FOB port of origin ^a		\$/ton	226	218	285	421	228	256	342	370
MUV multiplier		1.1450								
FOB, port of origin ^b (2011 constant)		\$/ton	259	250	326	482	261	293	392	424
Freight & insurance to Tajikistan ^c		\$/ton	110	110	110	110	110	110	110	110
Landed price, at Tajikistan's border		\$/ton	369	360	436	592	371	403	502	534
Financial Prices										
Handling, storage and losses	2.0%	\$/ton	7	7	9	12	7	8	10	11
Wholesale importer's margin	2.0%	\$/ton	7	7	9	12	7	8	10	11
Wholesale price		\$/ton	384	374	454	616	386	419	522	555
Transport, loading and unloading to retail market ^d		\$/ton	13	13	13	13	13	13	13	13
Retailers' margin	2.0%	\$/ton	8	8	9	13	8	9	11	11
Import parity farm gate price		\$/ton	404	394	475	641	407	440	545	579
Nutrient content			0	0	0	0	0	0	0	0
Financial farm gate price of Nitrogen nutrient		\$/ton	878	857	1,034	1,393	884	956	1,185	1,258
Financial farm gate price per kg of Nitrogen nutrient		\$/kg	0.88	0.86	1.03	1.39	0.88	0.96	1.19	1.26
Financial farm gate price in local currency	4.61	TJS/kg	4.05	3.95	4.77	6.42	4.08	4.41	5.46	5.80
Economic Prices										
Adjusted border price (adjusted by SERF)	1.11	\$/ton	409	399	484	657	412	447	557	592
Handling, storage and losses		\$/ton	7	7	9	12	7	8	10	11
Wholesale importer's margin		\$/ton	7	7	9	12	7	8	10	11
Wholesale price		\$/ton	424	414	502	681	427	463	577	614
Transport, loading and unloading to retail market ^d		\$/ton	13	13	13	13	13	13	13	13
Retailers' margin		\$/ton	8	8	9	13	8	9	11	11
Import parity farm gate price		\$/ton	445	434	523	706	448	484	600	638
Economic farm gate price of Nitrogen nutrient		\$/ton	966	943	1,138	1,534	973	1,052	1,305	1,386
Economic farm gate price per kg of Nitrogen nutrient		\$/kg	0.97	0.94	1.14	1.53	0.97	1.05	1.31	1.39
Economic farm gate price in local currency	4.61	TJS/kg	4.45	4.35	5.25	7.07	4.49	4.85	6.02	6.39

FOB = free on board, MUV = manufactures unit value, SERF = shadow exchange rate factor.

^a = Urea (46% N), bagged, varying origins, FOB Eastern Europe (Source: Global Economic Prospects, World Bank, 2004); ^b = using the MUV multiplier; ^c = Kiev to Dushanbe; ^d = an average distance of 100 kilometers.

Table A9.9: Cropping Mix at Appraisal and at Project Completion (%)

Crop	Asht		Vahdat		Farkhor		Pyanj		Rushan		Project		
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	With	Without
Cotton	24	21	0	14	41	51	44	50	16	16	31	37	31
Wheat	0	0	96	23	51	31	51	30	53	45	44	22	44
Vegetables	20	28	4	59	4	8	6	10	5	6	9	21	8
Orchard	56	50	0	0	0	0	0	0	0	0	13	13	13
Fodder/other	0	0	0	4	4	9	6	10	26	34	3	7	4

Source: Asian Development Bank estimates.

A9.10: Summary of Incremental Outputs by District

District	Crop	Area ha	Before Yield ton/ha	Area ha	With Yield ton/ha	Area ha	Without Yield ton/ha
Asht	Cotton	3,100	1.97	3,300	2.00	3,300	1.91
	Wheat						
	Vegetable	2,860	4.72	4,420	5.00	2,350	4.54
	Fruit	7,8000	1.82	7,800	2.30	7,500	2.13
	Total	13,760		15,520		13,150	
Farkhor	Cotton	7,614	2.20	8,823	2.65	7,614	2.13
	Wheat	9,350	2.00	5,288	2.36	9,350	2.09
	Vegetable	725	10.00	1,425	17.44	725	10.46
	Other	725	8.00	1,625	8.00	725	8.37
	Total	18,414		17,159		18,414	
Vahdat	Cotton		2.04	1,050	3.20		
	Wheat	7,200	10.00	1,750	4.46	7,200	2.62
	Vegetable	300		4,400	14.00	300	10.00
	Other			300	8.00		
	Total	7,500		7,500		7,500	
Pyanj	Cotton	7,386	2.11	8,302	2.61	7,386	2.24
	Wheat	8,546	1.77	4,914	2.20	8,546	1.87
	Vegetable	998	10.00	1,694	15.00	998	11.13
	Other	998	8.00	1,694	8.78	998	8.49
	Total	17,929		16,604		17,929	
Rushan	Potato	205	16.00	200	16.80	205	14.60
	Wheat	675	2.20	570	2.30	675	2.05
	Vegetable	65	21.00	70	22.10	65	19.50
	Fodder	325	2.80	430	2.95	325	2.65
	Total	1,270		1,270		1,270	

Source: Asian Development Bank estimates.

12. No allowance was made for changes to the state of the irrigation system beyond the specific sites and equipment rehabilitated. Without a system-wide understanding it is unclear to what extent the remaining infrastructure and equipment is able to sustain the gains achieved at project completion. It was identified during field visits of the irrigation schemes that that without continued capital inputs to overcome deferred capital replacement there would be major ongoing rehabilitation needs and risks to water delivery. In the case of Asht, more than \$2 million was still required to replace failing pumps that were not rehabilitated at the lower levels in addition to the rehabilitation of other pump stations. Similar situations were identified at Farkhor and Pyanj.

13. The estimated impact of the project on agricultural productivity (Table A9.11) is derived from a gain in the area of cotton (17%) and vegetable (163%) while the wheat area declined by 51%. The gain in vegetable production was mostly due to a shift in the cropping mix in Vahdat and the resumption of under-story cropping of orchards in Asht. All crops achieved significant yield increases relative to a without-project scenario, for cotton the gain was 16% whilst wheat increased 20% and vegetable productivity gained by over 40%.¹ The predicted yield increases were below appraisal targets for cotton (19%) and for wheat (21%) as included in the design and monitoring framework, however with the change to crop mix and prices such targets may not indicate project impact as they are specified on a before and after basis as opposed to a with-project and without-project basis.

14. The ineffectiveness of the agricultural demonstration and technology inputs contributed to lower than expected productivity gains. The appraisal predicted yield gains from (i) water supply of 1-2% per annum and (ii) 3-4% per annum from improved seed lines, agricultural technology and integrated pest management linked to the demonstration areas. These yield increases were confirmed as achievable in the demonstration areas created by the ADB financed technical assistance consultants. The demonstration areas financed by the loan reported yield gains but the lack of a series of control plots and the wide range of technologies reported preclude the attribution of yield benefits to specific options. The project failed to extend and implement improved agriculture technology throughout the project areas resulting in lower productivity gains. The gains from agricultural improvement demonstrated supports the view that increased investment in an extension of these technologies is a highly efficient use of project funds. The reduced scale of the demonstration program and significant cost savings in this output represent a significant oversight in project management and administration as several smaller demonstration areas could have been used in each district and overcoming the concern that 100 hectares was too large for demonstration purposes. At project completion, 20% of the demonstration area was implemented using 50% of the budget. Multiple smaller farm based demonstration areas would have facilitated extension and participation of growers and been a more efficient use of funds.

15. An important finding relating to pump-based irrigation systems was that significant water use savings were demonstrated with reportedly no yield depression. The ability to extend these technologies widely provides a major opportunity to reduce the volume of water requiring high cost pumping and would reduce operational costs.

¹ It is possible that a change in the mix of vegetables has contributed to these gains.

Table A9.11: Project Incremental Outputs

Crop	Change in area (ha)		Change in area (%)		Yield increase (%)		Total output (tons)	
	A	B	A	B	A	B	A	B
Cotton	3,374	3,174	19	17	21	16	16,556	14,633
Wheat	-13,249	-13,249	-51	-51	33	20	-17,594	-23,365
Vegetable	7,065	7,565	137	163	53	44	100,485	102,238
Apricot		300	0	4	26	8	3,744	1,965
Other	1,895	1,895	110	110	5	-1	16,484	15,727
Fodder	105	105	32	32	5	11	359	407

A = after – before; B = with and without.

Source: Asian Development Bank estimates.

4. Incremental Costs

16. Incremental costs due to the project investment are included for increased operation and maintenance (O&M) of the infrastructure and equipment that is supplied by the project to ensure its sustainability. An O&M charge of 1.5% of the project capital invested is included in the economic analysis. Sustainability of productivity gains will also require increased desilting and maintenance of secondary to terminal canals. A total cost of 0.06% of capital cost is included for these costs. The reevaluation assumes that these costs are not incurred under a without-project scenario.

17. Pumping costs changed significantly, with new pumps increasing pumping efficiency being offset by the increased volumes of water being pumped. Primary data was not available. The reevaluation uses the water demand estimates by crop and the before and after pumping efficiency estimates of the project preparatory technical assistance to calculate the water and energy requirements from a with-project less a without-project scenario. Water use efficiencies include changes to field, on-farm and conveyance efficiencies. The incremental volume of water is valued at the economic value of pumping costs set at TJS 0.06 per m³ of water.²

5. Economic Evaluation

18. The reevaluated EIRRs for the each district and the aggregate irrigation and agriculture investment indicates that Farkhor (16%), Vadhat (21%), and Pyanj (16%) have estimated EIRRs that exceed the 12% discount rate applied at appraisal, while Rushan and Asht project areas have an estimated EIRR of 10% and 9% respectively (Table A9.12). Collectively, the 5 districts have an EIRR of 12.3%. Inclusion of water management, agriculture demonstrations and project management investment costs resulted in an estimated EIRR of 11.8% for the whole project (excluding Hamadoni works).

19. In aggregate, the investments are considered to have been efficient although two of the project sites were less efficient. Key lessons relating to the lower efficiency given the relevance and effectiveness of implementation include (i) the lower effectiveness of investing in partial rehabilitations rather than concentrating the investment in fewer but fully rehabilitated irrigation systems, and (ii) the failure to realize the strategic value of the agricultural program in justifying the investment in irrigation infrastructure and its essential role in creating the conditions required

² The financial price of water is approximately TJS 0.017 per m³.

to achieve sustainability through water user funding of operations and maintenance costs. Without moving producers further up the potential production curve, farmers will remain unable to afford the necessary water service charges (see Section 6 below). The lack of sustainability is most likely understated in this economic reevaluation.

Table A9.12: Project Economic Evaluation

District	EIRR (%)	NPV (TJS)
Asht	8.7	-6,559,757
Farkhor	16.1	2,142,534
Pyanj	16.1	2,673,383
Rushan	9.6	-344,448
Vahdat	21.0	3,116,590
Total (5 districts)	12.3	1,028,302
Total Project^a	11.8	-643,040

EIRR = economic internal rate of return; NPV = net present value.

^a includes water management, agricultural and project management costs.

Source: Asian Development Bank estimates.

6. Sustainability

20. The current collection of water service fees is unlikely to result in the irrigation schemes being sustainable. Current fee rates do not reflect the cost of pumped irrigation water and will need to increase significantly. The collection ratio of fees is constrained by (i) inability to guarantee water supply and timing of supply due to ongoing rehabilitation needs that are currently not being addressed, (ii) the limited profitability of farmers constraining the ability to pay operating costs, (iii) the narrow definition of water user associations and the role they play, and (iv) the 20% to 30% of collected amounts that are allocated to the central government for their reallocation and/or use.

21. One of the lessons from the project is the importance of linking the hard irrigation and drainage investment to the profitability of the agriculture systems they support. The linkage to profitability is all the more important given the ADB requirement as stated in the project “covenant” for moving the irrigation schemes into a cost recovery and user pays framework based on the water service fees to be paid by users through the water user associations.

22. The limited scope of agricultural investment to support producers to move up the yield curve and increase revenues and profits enabling farmers to afford full cost recovery through water service fees was a significant design weakness. The design limited investment to demonstration of new technology and management systems. The weakness was further compounded by the acceptance by the Government and ADB to further reduce the input to the demonstrations from 500 to 100 hectares. The reduction was apparently due to a claim that a 100 hectare demonstration was too large for one irrigation system. There does not seem to have been any thought of having several smaller demonstrations to increase the relevance and contact with farmers.

23. The reduced demonstration was also accepted despite the findings of the piggy back ADB financed TA which reported significant gains from new agriculture technologies (Table A9.13). The TA results indicate increasing productivity and gross margins with plots that were based on farmer practice (Option I), the use of Ministry of Agriculture norms (Option II) and from optimized fertilizer and improved seed (Option III). The incremental benefits of moving from

Option I to Option III for wheat increased the gross margin by TJS300 to TJS2,400 per hectare with three of the five districts increasing by more than TJS1,100 per hectare. At these higher gross margins, the water service fee becomes a significantly smaller proportion of the gross margin per hectare and becomes affordable.

Table A9.13: Yield and Gross Margin Benefits from Agriculture Technologies

District	Crop	Yield (ton/ha)			2008 gross margin (TJS/ha)		
		Option I	Option II	Option III	Option I	Option II	Option III
Asht	Wheat	0.60	1.80	2.50	-159	1,626	2,248
	Cotton	1.60	2.00	3.12	-73	165	465
Vahdat	Wheat	1.30	3.00	4.80	670	1,176	1,732
	Cotton	1.70	2.60	3.60	-21	722	1,063
Pyanj	Cotton	2.20	3.50	3.80	741	2,038	2,175
Farkhor	Wheat	0.67	0.94	1.24	-768	-533	-489
	Cotton	2.10	2.30	2.90	-93	42	340
Rushan	Wheat	0.82	1.03	2.12	504	793	2,370

Option I = existing farmer practice; Option II = MOA norms for fertilizer; Option III = optimum fertilizer, improved seeds .

Source: Asian Development Bank estimates.

24. The Tajik Academy of Agricultural Science was contracted to implement the agricultural demonstrations at each irrigation system with a single site of 20 hectare per irrigation system completed with the total cost of approximately \$250,000, slightly over 50% of the approved cost in the RRP and loan agreement. The final report is in Russian but appears to be vague on what was the impact of the demonstrations. There was no access to those that implemented the demonstration sites during the project completion review mission, while the project implementation consultant to the monitoring and evaluation unit failed to monitor the demonstration plots despite including it in their responsibilities in the base-line report.

25. The government project completion report indicates yield increases of 1.5 to 3.0 times. These demonstration plots covered a wider range of crops, crop rotations, new seed, weed and pest control, cultivation techniques, water saving technologies etc. All are reported to be significantly positive, however, the reporting is often ambiguous and difficult to interpret. The overall conclusion is that it is possible to move farm production up the yield curve, and in association with other technologies this is achievable with reduced water inputs.

26. The economic benefit of agricultural investment was estimated based on the technical assistance findings by (i) converting the reported gross margins to economic values and from 2008 values to 2011 values; (ii) applying these gross margins to the same crop at the same locations using the with-project area of each crop; (iii) three scenarios were modeled representing the three demonstration plot replications (Option I, Option II and Option III); (iv) the incremental net cash flows were calculated for (II)-(I), (III)-(II), and (III)-(I); and (v) the net present value of the incremental net cash flows (NCFs) were calculated and compared to the NCF estimates for the irrigation and drainage subprojects. This reevaluation seeks to identify the lost economic value of the improved performance of the agricultural investment but only for the crops in the technical assistance demonstration, such that not all command area crops benefit. The estimate is therefore a conservative estimate of the increased value possible. For example, in Asht and Vahdat where orchards and vegetables dominate the command area the impacts are limited to a small proportion of the command area. The gross margins of the technical assistance include the increased cost from increased quantities and quality of inputs; however, for scenario (II) the model assumes an annual cost of TJS75,000 for ten years, and for

scenario (III) TJS112,500 per year for ten years being the cost of extension. Uptake of new technology is forecast to achieve 100% uptake over a ten year period in a linear response between scenario (I) and scenario (II) yields.

27. The yields in the irrigation subproject economic analysis for cotton are similar to the demonstrations whilst wheat differ more from the demonstration yields. The irrigation subprojects yields are similar to, but above, the yields in scenario (I) (Table A9.14). The benefits from fertilizer and seed improvement are all of the gains from scenario (III) and scenario (II) and most of the gains from scenario (II) and scenario (I).

Table A9.14: Net Present Value (r=0.12) for the Irrigation System and Incremental Agricultural Scenario (TJS)

	Asht	Farkhor	Pyanj	Vahdat	Rushan
NPV Irrigation	-5,057,490	1,329,586	3,131,852	3,103,159	-240,450
NPV (II) – (I)	143,616	2,002,796	1,968,950	256,979	2,402,880
NPV (III) – (II)	181,029	505,968	207,977	160,079	4,740,127
NPV (III) – (I)	324,645	2,508,764	2,176,927	417,058	7,143,007

Source: Asian Development Bank estimates.

28. The results of the comparative assessment indicate significant differences between districts. For Asht the gains were limited to cotton, and consequently the economic gains were estimated to be TJS 324,645, however, the irrigation subproject generated a negative net present value. Vahdat had a similar limited economic gain of TJS417,058 again due to the dominance of vegetable production. The remaining three districts had far more significant benefits. Pyanj achieved significant gains from cotton that accounted for 50% of the command area. Wheat was not included in the demonstration area despite being planted on 30% of the command area. The economic value of agriculture gains from cotton in Pyanj was 60% of the value of economic benefits generated from the irrigation investment of nearly \$3.3 million. Even greater gains were demonstrated in Farkhor with economic benefits nearly twice the value of the irrigation and drainage investment of \$3.49 million. Rushan district faces food security issues and very limited irrigation command areas. Here the demonstration scenario generated significantly higher economic returns several orders of magnitude greater than irrigation and drainage subproject economic benefits that failed to achieve the hurdle rate of 12%. The gains were significantly higher with the progression from scenario II through to scenario III reflecting the lack of access and use of improved agricultural inputs.

29. The stated requirement of ADB to achieve sustainability through water user charges needs to be supported by balancing the investment between the easy to disburse supply driven input to irrigation infrastructure with the more complex demand driven investment into water use and the technologies they have access to and apply. Future designs should place far greater balance on the investment into irrigation infrastructure by including realistic support for farmers to move up the yield curve and then ensure that it is implemented. Future agricultural investment should be assigned to an appropriate implementing agency responsible for agriculture.

C. Water Supply Reevaluation

30. At appraisal the economic assessment of the water supply scheme outputs used a simplified method for ascertaining if each rural water supply scheme meets the required economic criterion i.e., that the present value of benefit exceeds the present value of costs at the opportunity cost of capital.

1. Physical Output

31. Five water supply schemes were implemented, however the Asht and Pyanj schemes serve far fewer people than estimated at appraisal while Vahdat serves 50% more (Table A9.15). Service levels are still restricted due to electricity shortages resulting in water supply to the scheme storage tanks being limited to two hours in the morning and evening periods. Most schemes are unable to supply water year round due to cold temperatures. The Pyanj scheme is expected to increase its number of users with a neighboring community requesting water supply and the proposed connection of further households on land in close proximity.

2. Investment Costs

32. The total investment (in USD terms) in rural water supply was reduced by 43% from \$2.45 million to \$1.6 million. In local currency terms the investment only fell by 10% less than the appraisal level at TJS7.4 million. The data and terms for each district used to develop estimates of time savings and costs are presented in Table A9.15.

Table A9.15: Water Supply Scheme Physical Achievement and Target

District	Villages served	Completion population served	Appraisal population served (2004)	Actual capital cost (\$)	Actual capital cost (TJS)
Asht	1	4,220	13,110	408,615	1,883,715
Vahdat	6	15,000	10,120	202,970	935,692
Farkhor	2	5,200	5,600	227,665	1,049,536
Pyanj	2	600	10,400	578,919	2,668,817
Rushan	1	5,800	5,360	188,164	867,436
Total	12	30,820	44,590	1,606,333	7,405,195

Source: Asian Development Bank estimates.

3. Appraisal Approach for Economic Analysis

33. The approach was developed by ADB's Economic Research Department (as part of an Indonesian PPTA)³ and focuses on time savings to determine if the economic criterion is met.⁴ Using this approach the appraisal determined that an investment is economically justified if the annual net benefits exceed the annualized costs i.e., if it has a positive NPV. Under certain conditions, an investment in rural water supply has a positive NPV if

$$(1) \quad (c_0 - c_1) Q + v(d/s + w) N \geq r C / \{(1 - 1/(1+r)^{T+1})(1 + k g / r)\}$$

Where,

C - is the capital cost of the investment

r - is the opportunity cost of capital

T - is the life of the investment

g - is the annual growth of benefits

k - is a function of r and T

³ ADB. 2002. *Technical Assistance to the Republic of Indonesia for the Community Water Services and Health*. Manila.

⁴ ADB. 2004. *Report and Recommendation to the President to the Board of Directors: Proposed Loan for Irrigation Rehabilitation Project*. Manila. (Detailed description can be found in the Supplementary Appendix H2 of the Report and Recommendation for the President).

c_0 and c_1 are the initial marginal cost and the marginal cost associated with the investment
 Q - is the total initial consumption adjusted for future changes in consumption and the price elasticity of demand
 N - is the initial number of trips scaled with the same factor as Q
 v - is the value of time
 d - is the average reduction in carrying distance
 s - is the average carrying speed
 w - is the change in waiting time

34. The reevaluation estimate of the economic criterion (Table A.16) indicates that each scheme was efficient. The above assessment does not take into account significant non-quantified benefits linked to (i) reduced incidence of gastroenteritis – for example, Farkhor and Pyanj water supply committees indicated that communities had experienced an almost 100% reduction in both mosquito/malarial disease and gastroenteritis associated illnesses. Further, the provision of water locally provided significant reductions in daily drudgery mostly associated with women and children enabling greater participation in schooling and economic activities.

35. The strongest indicator of the benefit of the piped water supply was the demand from adjoining households, industry and public services to connect to the systems including whole communities and their willingness to pay for the water, although water charges remain well below the full cost of service provision. Overall the schemes are considered to be efficient.

36. The sustainability of the water supply schemes is far less certain. Water use fees have been established based on per capita and per m^3 basis. Current collection rates are high at nearly 90%. Interviews during the field visit indicate that the schemes are still unable to finance their direct costs with current revenues amounting to as little as 40% of expected costs. Growth in connections and fees will be necessary but may not cover the short-fall as a large proportion of total cost remains the pumping charges that are linked to the volume of water lifted. Additional connections will increase this cost. The water supply schemes are rated as likely to be sustainable on the basis of (i) public demand for being part of schemes, (ii) the significant costs associated with the next best supply, and (iii) the likely maturing of water users and paying for services.

Table A9.16: Results of Economic Test

District	Time savings ($d/s+w$) hrs/trip	Annualized costs and O&M costs ($K/N + k_1/N$) hrs/trip	Economic criterion time savings > Costs	Time savings ($d/s+w$) hrs/trip	Annualized costs and O&M costs ($K/N + k_1/N$) hrs/trip	Economic criterion time savings > costs
		At Appraisal			Completion	
Asht	1.460	0.335	Yes	0.435	0.069	Yes
Vahdat	0.676	0.158	Yes	0.330	0.012	Yes
Farkhor	1.305	0.392	Yes	0.642	0.020	Yes
Pyanj	1.042	0.600	Yes	0.510	0.137	Yes
Rushan	0.706	0.166	Yes	0.345	0.206	Yes

Source: Asian Development Bank estimates.

GENDER ACTION PLAN

1. The project was to address concerns regarding the state of irrigation and urban potable water supply infrastructure by taking action on the one hand to improve (i) women's participation in the water users' associations (WUAs), water committees, and in the planning, implementation, and monitoring and evaluation of the project; (ii) their access to project information; and (iii) their technical skills in farm production and organizational skills as they become involved in community-based organizations and project-related activities; and on the other hand promote gender responsiveness among policy makers and other stakeholders involved in the project.

2. The gender equality results were sound, indicated as follows:

- (i) **Women's representation.** The project was to ensure that in the provision and delivery of each of the four project components, the participation of women would be ensured. Under the rehabilitation of irrigation and drainage infrastructure component (a) 50% of households headed by women in the project sites would be members of the WUAs; and (b) at least 25% of representatives in the project design, planning and implementation meetings would be women. These targets were achieved. For the improvement of potable water supply systems component, the target of at least 30% of the members of the local drinking water-decision making bodies was met. In the support for agricultural development component more than 30% of women farm workers were members of local farmer groups. In the project management, and monitoring and evaluation (M&E) component, more than 20% of the staff of project offices, project implementation units, and the M&E units were women.
- (ii) **Skills enhancement for women.** The project achieved its targets of (a) more than 20% of farm households headed by women participated in the project's core demonstration activities; (b) 35% of those trained in land and water farm management, new cultural practices, and rural water supply management were women; and (c) at least 25% of those participating in other organizational skills enrichment were women.
- (iii) **Provision of a gender specialist.** A gender and social development specialist was not employed by the project management office (PMO) as designed at appraisal. This position was to (a) provide and assessment of the gender and social (including poverty) issues and concerns in the project sites using quantitative and qualitative methods of analysis, (b) develop a gender action plan that would address the issues and concerns related to the project, and (c) develop an implementation mechanism and advocacy strategy for following through the action plan. The specialist was also to assist in the design of the M&E system to ensure it incorporated gender, poverty, and social concerns adequately. These tasks and outputs were not achieved given the lack of appointment of the specialist. The M&E system collected gender indicators as required in the design and monitoring framework, however the extent and quality of the information required was deficient due to lack of gender specialist input.
- (iv) **Gender sensitivity in monitoring and evaluation.** The gender and social development specialist was to ensure that the design of the M&E system

incorporated inputs, outputs, and outcome indicators that reflect women's concerns about the project. The M&E system was also to include a feedback mechanism to provide project staff information and assessments of the perceptions and views of the project's female and male beneficiaries on the progress and impact of the project. These tasks were not achieved due to the non-appointment of the gender specialist.

- (v) **Advocacy for gender and development.** Gender and development as an integral policy outcome of the project was to be pursued through the inclusion of gender-related agenda in the policy dialogues with central and local policy makers and in stakeholders meetings and other forums that were to be initiated during the project. This outcome was not achieved.

3. The limited achievement of some of the gender requirements of the project reflects the primary focus of project management upon implementing the physical infrastructure components. Consequently, less attention was applied to other components such as implementing on-farm demonstration activities, ensuring widespread training of beneficiaries, developing a comprehensive M&E system, and ensuring gender-based activities were implemented.