



# Completion Report

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Project Number: 36233  
Loan Number: 1912  
April 2006

## Tajikistan: Emergency Baipaza Landslide Stabilization Project

Asian Development Bank

## CURRENCY EQUIVALENTS

Currency Unit – somoni (TJS)

		<b>At Appraisal</b> (as of 25 June 2002)	<b>At Project Completion</b> (as of 28 December 2005)
TJS1.00	=	\$0.357	\$0.3128
\$1.00	=	TJS2.80	TJS3.1962

## ABBREVIATIONS

ADB	–	Asian Development Bank
BHPS	–	Baipaza Hydro Power Station
MOE	–	Ministry of Energy
BT	–	Open Joint-Stock Holding Company—Barki Tajik
PCR	–	project completion review
PIU	–	project implementation unit
PSC	–	project steering committee

## WEIGHTS AND MEASURES

MW	–	megawatt
km	–	kilometer
m <sup>3</sup>	–	cubic meter
m <sup>2</sup>	–	square meter

## NOTE

In this report, "\$" refers to US dollars.

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## BASIC DATA

### A. Loan Identification

1.	Country	Tajikistan
2.	Loan Number	1912
3.	Project Title	Emergency Baipaza Landslide Stabilization Project
4.	Borrower	Republic of Tajikistan
5.	Executing Agency	Ministry of Energy
6.	Amount of Loan	SDR4,001,000 (\$5.32 million)
7.	PCR Number	PCR: TAJ 937

### B. Loan Data

1.	Appraisal	
	– Date Started	12 Jun 2002
	– Date Completed	25 Jun 2002
2.	Loan Negotiations	
	– Date Started	13 Aug 2002
	– Date Completed	15 Aug 2002
3.	Date of Board Approval	10 Sep 2002
4.	Date of Loan Agreement	10 Oct 2002
5.	Date of Loan Effectiveness	90 days after the date of Loan Agreement
	– In Loan Agreement	
	– Actual	15 Oct 2002
	– Number of Extensions	None
6.	Closing Date	
	– In Loan Agreement	31 May 2004
	– Actual	20 Dec 2005
	– Number of Extensions	3
7.	Terms of Loan	
	– Maturity	32 years
	– Grace Period	8 years
	– Interest Rate During Grace Period	1.0%
	– Interest Rate After Grace Period	1.5%
9.	Disbursements	
a.	Dates	

Initial Disbursement	Final Disbursement	Time Interval
30 Oct 2002	20 Dec 2005	38.23 months

Effective Date	Original Closing Date	Time Interval
15 Oct 2002	31 May 2004	19.8 months

## b. Amount (SDR)

Category or Subloan	Original Allocation	Last Revised Allocation	Amount Canceled	Amount Disbursed
Civil Works	1,998,000.00	2,041,116.00	501,348.00	1,539,768.00
Equipment	1,274,000.00	1,014,053.00	-16,148.00	1,030,201.00
Consulting Services	376,000.00	409,459.00	-42,402.00	451,861.00
Interest Charge	49,000.00	49,000.00	8,793.00	40,207.00
Unallocated	304,000.00	9,876.00	9,876.00	0.00
Imprest Fund	0.00	0.00	0.00	0.00
<b>Total</b>	<b>4,001,000.00</b>	<b>3,523,504.00<sup>a</sup></b>	<b>461,467.00</b>	<b>3,062,037.00</b>

<sup>a</sup> Partial cancellation totaling SDR477,496.28 was effected in September 2004.

10. Local Costs (Financed)
- Amount (\$) \$2,178,599
  - Percent of Local Costs 51
  - Percent of Total Cost 33

## C. Project Data

## 1. Project Cost (\$'000)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	2,404	2,246
Local Currency Cost	4,248	3,223
<b>Total</b>	<b>6,652</b>	<b>5,469</b>

## 2. Financing Plan (\$'000)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	1,330	1,045
ADB Financed	5,257	4,364
Other External Financing	0	0
<b>Total</b>		
IDC Costs		
Borrower Financed	0	0
ADB Financed	65	60
Other External Financing	0	0
<b>Total</b>	<b>6,652</b>	<b>5,469</b>

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

## 3. Cost Breakdown by Project Component (\$'000)

Component	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
1. Base Costs						
a. Part A:						
i. Emergency Measures	287	3,000	3,287	239	2,656	2,895
ii. Disaster Preparedness	1,681	13	1,694	1,525	0	1,525
b. Part B: Feasibility Study	300	100	400	422	0	422
c. Taxes and Duties	0	700	700	0	567	567
<b>Total Base Cost</b>	<b>2,268</b>	<b>3,813</b>	<b>6,081</b>	<b>2,186</b>	<b>3,223</b>	<b>5,409</b>
2. Contingencies						
a. Physical	52	401	453	0	0	0
b. Price	19	34	53	0	0	0
3. Interest during Construction	65	0	65	60	0	60
<b>Total Project Cost</b>	<b>2,404</b>	<b>4,248</b>	<b>6,652</b>	<b>2,246</b>	<b>3,223</b>	<b>5,469</b>

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Consulting Services		
Started	Aug 2002	4 Nov 2002
Completed	Oct 2003	30 Jun 2005
Civil Works Contract		
Started	Jun 2002	10 Mar 2002
Completed	Dec 2003	30 Jun 2005
Procurement of Vehicles, Equipment and Supplies		
First Procurement	Jun 2002	21 Feb 2003
Last Procurement	Nov 2002	16 Jun 2005
Other Milestones		
Final Cancellation	31 May 2004	20 Dec 2005

## 5. Project Performance Report Ratings

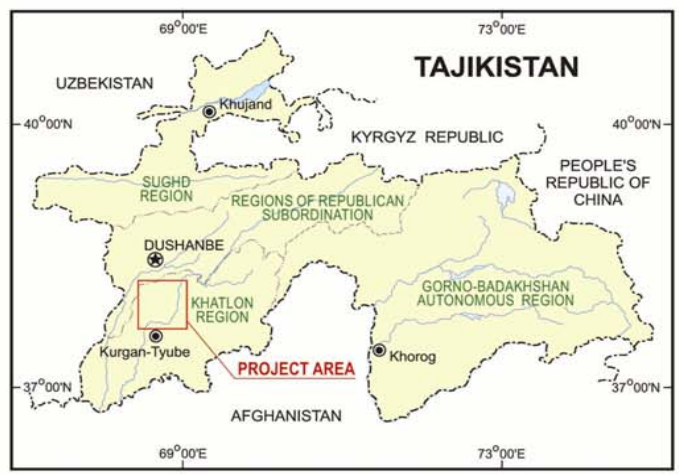
Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 1 Sep 2002 to 31 Dec 2002	Satisfactory	Satisfactory
From 1 Jan 2003 to 31 Mar 2003	Satisfactory	Satisfactory
From 1 Apr 2003 to 30 Jun 2003	Satisfactory	Satisfactory
From 1 Jul 2003 to 30 Sep 2003	Satisfactory	Satisfactory
From 1 Oct 2003 to 31 Dec 2003	Satisfactory	Satisfactory
From 1 Jan 2004 to 31 Mar 2004	Satisfactory	Satisfactory
From 1 Apr 2004 to 30 Jun 2004	Satisfactory	Satisfactory
From 1 Jul 2004 to 30 Sep 2004	Satisfactory	Satisfactory
From 1 Oct 2004 to 31 Dec 2004	Satisfactory	Satisfactory
From 1 Jan 2005 to 31 Mar 2005	Satisfactory	Satisfactory
From 1 Apr 2005 to 30 Jun 2005	Satisfactory	Satisfactory
From 1 Jul 2005 to 30 Sep 2005	Satisfactory	Satisfactory
From 1 Oct 2005 to 31 Dec 2005	Satisfactory	Satisfactory

**D. Data on Asian Development Bank Missions**

<b>Name of Mission</b>	<b>Date</b>	<b>No. of Persons</b>	<b>No. of Person-Days</b>	<b>Specialization of Members</b>
Appraisal Mission	12–25 June 2002	2	26	a,f
Inception Mission	4–16 Oct 2002	2	24	a,d
Midterm Review Mission	5–12 Dec 2002	1	7	a
Loan Review	17–18 Mar 2003	2	4	a,d
Loan Review	9–15 May 2003	1	6	a
Loan Review	21 Jun 2003	1	1	a
Loan Review	14–19 Sep 2003	1	5	a
Loan Review	5–9 Nov 2003	1	4	a
Loan Review	15–18 May 2004	1	3	a
Loan Review	25–31 Jul 2004	3	18	a,b,d,
Loan Review	6–11 Dec 2004	2	10	c,d
Loan Review	20–26 Jan 2005	1	6	a
Loan Review	28 Feb–7 Mar 2005	3	21	a,b e
Loan Review	5–9 Apr 2005	1	4	a
Loan Review	8–12 Jul 2005	1	4	a
Loan Review	16–19 Oct 2005	2	6	a,b
Project Completion Review <sup>b</sup>	27 Nov–2 Dec 2005	2	10	a,d

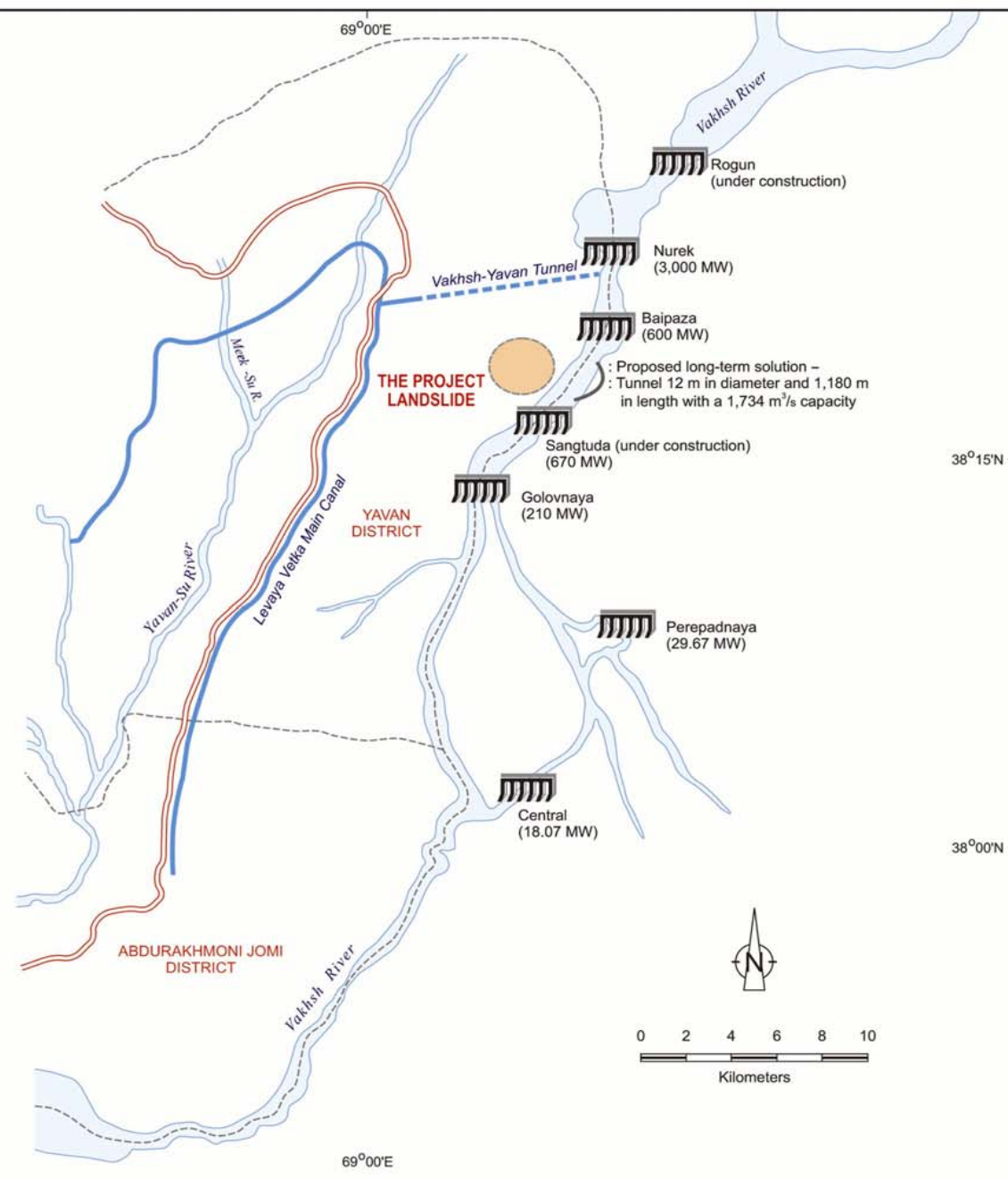
a = energy specialist (mission leader), b = energy specialist (financial), c = social development specialist, d = assistant project analyst, e = environment specialist, f = consultant.

<sup>b</sup> The project completion report was prepared by X. Humbert, energy specialist and mission leader, assisted by C. B. Africa, assistant project analyst.



## TAJIKISTAN EMERGENCY BAIPAZA LANDSLIDE STABILIZATION PROJECT (as completed)

- Project Landslide Area
  - National Capital
  - Provincial Capital
  - Highway
  - Tunnel
  - Canal
  - Hydropower Station
  - River
  - District Boundary
  - Provincial Boundary
  - International Boundary
- Boundaries are not necessarily authoritative.





## **I. PROJECT DESCRIPTION**

1. On 3 March 2002 at 4:10 p.m., Tajikistan experienced an earthquake, measuring 7.4 on the Richter scale, with the epicenter in neighboring Afghanistan. It caused a large volume of earth and rocks to slide down the mountainous banks of the Vakhsh River about 5 kilometers (km) downstream from the 600 megawatt (MW) Baipaza Hydropower Station (BHPS) in the Khatlon region. The landslide material partly blocked the narrow waterway, creating an unstable water reservoir and causing the water level to rise by 7 meters (m). The rising water level threatened the operation of the BHPS,<sup>1</sup> the flows to the Pravaya-Vetka main canal, and the water supply to downstream communities. Further smaller movements and slips were noticed, which threatened a complete blockage of the Vakhsh, and the possible swell could submerge the BHPS. The Government of Tajikistan immediately blasted and removed the landslide material from the riverbed to restore water flow.

2. Since the mountain slope was uninhabited, there was no loss of life or property, or any threat to people. However, a substantial blockage of the Vakhsh would disrupt power-generating capacity, comprising five hydropower stations, totaling 3,858 MW or 90% of the country's generation capacity. If the unstable dam fails, water supply in Turkmenistan and Uzbekistan would be disrupted, threatening downstream communities, installations, and infrastructure.

3. Following the Government's request for emergency assistance to stabilize the Baipaza landslide, an appraisal mission was fielded on 12–25 June 2002. This was followed by loan negotiations with the authorized representatives of the Government on 13–15 August 2002. ADB approved the Emergency Baipaza Landslide Stabilization Project<sup>2</sup> on 10 September 2002.

4. The Project's outcome was to restore the flow of the Vakhsh to its pre-disaster condition and start measures to limit further degradation of the landslide. The Project's impact was to prevent severe disruption of the Government's economic development and poverty reduction program.

5. The Project helped the Government (i) carry out emergency slope stabilization, (ii) improve disaster preparedness, and (iii) undertake a feasibility study to determine a long-term solution to the threat of river blockage.

## **II. EVALUATION OF DESIGN AND IMPLEMENTATION**

### **A. Relevance of Design and Formulation**

6. ADB approved the Project under its policy of providing rehabilitation assistance after disasters. It enabled Tajikistan to continue with development financing that otherwise would have been diverted for disaster rehabilitation. The Project was designed with the participation of government agencies, which facilitated appropriate design, cost estimate, and adequate allocation for contingencies. It consisted of (i) part A: the emergency slope stabilization project and disaster preparedness; and (ii) part B: the feasibility study for a long-term solution. Bench

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<sup>1</sup> The average flow in the Vakhsh River in this section is about 600 cubic meters (m<sup>3</sup>)/second. However, when the Nurek hydropower station spills surplus water in summer, the flow increases to about 1,600 m<sup>3</sup>/second.

<sup>2</sup> ADB. 2002. *Report and Recommendation of the President on a Proposed Loan to the Republic of Tajikistan for the Emergency Baipaza Landslide Stabilization Project*. Manila.

cutting and terracing<sup>3</sup>, removing material, and constructing drains in the landslide area were the immediate responses. The Project improved disaster preparedness by providing monitoring and earthmoving equipment. A radio communication system was also provided to handle emergencies promptly and efficiently. The combination of emergency measures and disaster preparedness was considered the appropriate response to the landslide. For the long-term solution, several options were considered, including the construction of a tunnel to bypass the area susceptible to landslides. ADB's assistance for slope stabilization and disaster preparedness, and the study of a long-term solution were relevant to the Government's program and ADB's strategy, at appraisal and now. Overall, the Project design was comprehensive and relevant.

## B. Outputs

7. Before part A, the area was surveyed and investigated to prepare the design and estimate the amount of emergency works needed. The topographic survey covered the landslide, areas to be cut and removed, and access to the spoil disposal site.<sup>4</sup> Investigation consisted of geological mapping, drilling, and trial pitting to define the mechanism of the landslide and to obtain geotechnical data to finalize the design of the earthworks. Geological mapping was considered the most important activity.

8. The engineering design activity for emergency slope stabilization consisted of (i) confirming the earthworks slope and other stability calculations, drainage configuration, and development of standards for the civil works; (ii) a detailed layout and section of the access road and spoil disposal areas; and (iii) preparation of construction drawings, bill of quantities, specifications, and bid and contract documents.

9. The specific project outputs were the following:

- (i) **Rehabilitation of the access and tractor road to the site.** The access road to the top of the landslide area was rehabilitated, and a new road constructed. New roads were constructed from the slide area to the spoil disposal sites. A total of 19.9 km of access road and 28.7 km of tractor road for spoil disposal were constructed, compared with a total of 30.0 km of access and tractor roads estimated at appraisal.
- (ii) **Terracing, haulage, and placement of spoil from top of slide.** To stabilize the landslide, terraces were cut immediately above the landslide. The quantity of the earth removed was 557,932 m<sup>3</sup> compared with the 600,000 m<sup>3</sup> at appraisal (93% of the estimate).
- (iii) **Seeding and revegetation of the terrace.** To secure the terrace surface, the Executing Agency—the Ministry of Energy (MOE)—modified the design to include seeding or revegetation with indigenous grass and plants. The total area seeded was 157,289 m<sup>2</sup>.

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<sup>3</sup> Bench cutting is a term used to describe works needed to stabilize steep mountain slopes, it involves removal of soil or rock materials from the higher elevation to reduce the load that may cause a landslide in the lower part of the slope. Terracing levels horizontally the benches to reduce erosion.

<sup>4</sup> Spoil is the unstable earth and rocks that had to be removed from the slope, including the earth resulting from terracing.

- (iv) **Redistribution of slide material in the middle portion of the landslide area.** The slipped spoil material was excavated from the area below the current landslide to reduce load and increase the slope stability. The quantity of the earth removed was 174,388 m<sup>3</sup> compared with 200,000 m<sup>3</sup> estimated during appraisal (87% of the estimate).
- (v) **Shallow surface drainage.** Open trench drains were constructed in the upper slopes, totaling 1.64 km compared with 2.00 km at appraisal (82% of the estimate).
- (vi) **Domestic consultant supervision.** Domestic consultants were engaged to supervise the civil works. Their services totaled 136 person-months, or about twice estimated at appraisal, because of implementation delays. The consultants provided inputs for surveys, investigation, design, construction supervision, environmental monitoring, and social impact assessment.
- (vii) **Training and capacity building.** An international consultant was engaged for 3 months to confirm the design and guide the civil works. During project implementation, the international consultant strengthened the capacity of the domestic consultants and MOE in contract management.
- (viii) **Disaster preparedness.** Earthmoving and monitoring equipment was supplied in accordance with the project agreement.
- (ix) **Feasibility study for a long-term solution.** This was carried out by an international consultant. The proposed long-term solution was the construction of a 1,180 m tunnel with a cross-section of 12 x 12 m and a capacity of 1,734 m<sup>3</sup> on the left bank of the river that will bypass the slide for a base cost of \$32 million.

### C. Project Costs

10. At appraisal, the project cost was estimated at \$6.65 million equivalent, comprising foreign exchange of \$2.40 million equivalent (36%) and local currency of \$4.25 million equivalent (64%).

11. At completion, project expenditures amounted to \$5.47 million equivalent (82% of the estimate), including a foreign currency cost of \$2.24 million equivalent (41%) and a local currency cost of \$3.22 million equivalent (59%). Interest during construction (\$59,743 equivalent) was lower than that estimated at appraisal (\$65,000 equivalent). The comparison of estimated and actual costs is shown in Appendix 1. The actual cost of the emergency measures was lower than estimated by 12%, and of taxes and duties by 15%. The physical contingencies (7% of the estimate) were unused because the final quantities were close to the design, and the scope did not need substantial change. Following the contract award, when actual quantities were known (September 2004), \$700,000 equivalent of the uncommitted amount was canceled following an agreement with the Government.

### D. Disbursements

12. The loan disbursed totaled SDR3,062,037 (\$4.42 million equivalent). After reconciliation and physical closure of the project account, the undisbursed balance of SDR461,467 (\$663,395

equivalent) was canceled. The retroactive financing carried out before loan approval was \$129,948 (about 2% of the loan amount). Appendix 2 shows how loan proceeds were used.

13. The project imprest account significantly facilitated project implementation. At appraisal, the imprest account ceiling was fixed at \$500,000 equivalent, or about 10% of the loan amount, in accordance with the prescriptions of the ADB's *Disbursement Handbook*<sup>5</sup>. The Project did not encounter cash flow problems, and the ceiling amount did not have to be revised.

## **E. Project Schedule**

14. The loan was declared effective on 15 October 2002. The works that started soon after the earthquake were financed retroactively. At appraisal, the Project was expected to be implemented over 20 months, from June 2002 to December 2003, and the loan to be closed in May 2004. The Project was completed in June 2005 and closed by the State Inspection Commission on 30 August 2005. The loan closing date had to be extended three times, first two extensions to allow completion of part A, and again from 30 June 2005 to 31 December 2005 to enable the consultant under part B to submit the final report and bill.

15. Risks that could delay implementation were identified during appraisal: (i) adverse meteorological conditions; (ii) new earthquakes; (iii) inability of the contractors to meet quality standards and the schedule; and (iv) inexperience of MOE and of the Implementing Agency, Open Joint-Stock Holding Company—Barki Tajik (BT), with ADB's procurement procedures.

16. Implementation was delayed by (i) adverse meteorological situations during the winter of 2002–2003, when the work was stopped for 5 consecutive months because of the harsh weather and heavy rainfall; (ii) MOE's unfamiliarity with ADB procurement procedures; (iii) a car accident in May 2003 on the access road to the site, which fatally injured two people, including the project implementation unit (PIU) director<sup>6</sup>; (iv) a landslide in June 2004 that destroyed some access roads and terraces, which required rectification works; and (v) another landslide in May 2005 that completely destroyed about 900 m of access roads, which had to be reconstructed. The limited and outdated fleet of trucks and earthmoving equipment slowed down rehabilitation.

17. The recruitment of the international consultant for part B was delayed because MOE was unfamiliar with ADB's guidelines and procedures. The consultant faced difficulties during the initial data collection, and the geological surveys took longer than expected because modern and efficient drilling equipment was not available.

## **F. Implementation Arrangements**

18. The implementation arrangements were essentially the same as envisaged at appraisal. The Executing Agency was MOE and the Implementing Agency was BT. The PIU, headed by a project director, was established within BT and was responsible implementing the Project. However, in January 2004, the Government merged MOE and BT.

19. The project steering committee (PSC) met every week and mostly on site, which ensured effective coordination of project activities. The PSC was chaired the deputy prime

<sup>5</sup> ADB January 2001 – *Loan Disbursement handbook* - Manila

<sup>6</sup> Investigations revealed that the accident was caused by mechanical failure in the vehicle. Families of the victims were duly compensated.

minister and included representatives from MOE, BT, and the design and research institute. The PIU prepared monthly progress reports and presented them to the Government.

20. The PIU was adequately staffed. The implementation arrangements were effective. An implementation schedule is in Appendix 3. The organization chart for project implementation is in Appendix 4.

## **G. Conditions and Covenants**

21. All the major covenants were complied with. The Project generally employed the measures to mitigate the environmental impact as provided in the summary initial environmental examination. The Government's compliance with the other loan covenants was satisfactory (Appendix 5).

22. At appraisal, it was generally understood that the Government would not relend the loan proceeds to BT. However, on 20 October 2003, a subsidiary loan agreement was signed between the Ministry of Finance and BT. Its terms were the same as for the ADB loan—a 32-year term, an 8-year grace period, and an interest charge of 1.0% per year during the grace period and 1.5% thereafter. This additional liability has not adversely affected the debt service capacity of BT, which is regularly monitored through another ongoing loan.<sup>7</sup>

## **H. Consultant Recruitment and Procurement**

23. Goods, civil works, and services were procured in accordance with ADB's *Guidelines for Procurement* and *Guidelines on the Use of Consultants*. MOE procured earthmoving equipment, a mobile crane, and other disaster preparedness equipment through international shopping. Civil works were procured through local competitive bidding as envisaged at appraisal. Appendix 6 summarizes the contracts awarded.

24. Because the Project was an urgent one, contracts for some early civil works were awarded using force account procedures. To complete essential parts of the works before the first wet season, the same civil contractor was allowed to continue until a new contractor could be selected using local competitive bidding procedures. Preparation of the bid documents and bid evaluation, and long and difficult contract negotiations delayed the local competitive bidding contract award. The lowest bidder did not respond, and contract negotiations were held with the second-lowest bidder. The contract was finally awarded on 14 November 2003, after a delay of 6 months.

25. At appraisal, 61 person-months of consulting services using individual domestic consultants were envisaged to assist the PIU. The domestic consultants started their services in November 2002. They handled topographical surveys, investigation, design, construction supervision, environmental monitoring, and social impact assessment. The consulting services had to be extended because of delays in project implementation, and the following increases were made: (i) team leader, 12 person-months; (ii) land surveyor, 10 person-months; (iii) work supervisors, 38 person-months; (iv) environmental specialist, 5 person-months; and (v) geologist, 10 person-months. The Project required 136 person-months of domestic services, more than twice the estimate.

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<sup>7</sup> ADB. 2000. *Report and Recommendation of the President on a Proposed Loan and Technical Assistance Grants to the Republic of Tajikistan for the Power Rehabilitation Project*. Manila.

26. At appraisal, 4 person-months of international consulting services were envisaged to help the PIU review surveys and investigations, project design, documents, and bid evaluation. Contract negotiations for consulting services were completed in January 2003, and the consultant undertook his first mission only after 3 months when the Project required his input. This delay was required because procurement of goods, other services, and the project design were delayed, too. A total of 3 person-months of consulting services were required.

27. At appraisal, international consulting services for part B were estimated at 9 person-months and domestic at 33 person-months. The services of international consultants had to be extended by 4.3 person-months to complete the presentation and discussions of the draft final report in Dushanbe on 5 April 2005.

28. Procurement of equipment was conducted through international shopping and direct purchase. Seven contracts for equipment supply were awarded. Procurement of equipment was delayed, and one bid package had to be re-tendered because of noncompliance with ADB's *Guidelines on Procurement*. Appendix 6 lists the equipment contracts.

#### **I. Performance of Consultants, Contractors, and Suppliers**

29. The performance of the domestic consultants for part A is rated satisfactory. Although they did not fully understand ADB procedures, the domestic consultants supervised the works efficiently and their reports were of acceptable quality. The team leader is rated highly satisfactory because of his rich experience, hard work, and leadership, which helped maintain a cordial environment. However, the environmental specialist is rated partly satisfactory, based on the quantity of work and failure to properly document the mitigation measures taken by the civil contractors. The international consultant under part A is rated satisfactory.

30. The international consultant for part B provided the required services despite difficulties in gathering data that were initially considered strategic (detailed aerial photography), and obsolete drilling equipment. The draft final report was not completed on time, and more than 6 months elapsed between the presentation of the draft final report and the submission of the final report. The consultant is therefore rated partly satisfactory.

31. The government agencies, contractors, suppliers, and consultants maintained close coordination and good relations, which allowed the Project to be completed without any disputes or unexpected claims. This is a positive aspect considering the Project's emergency nature.

#### **J. Performance of the Borrower and the Executing Agency**

32. The Borrower demonstrated strong ownership of the Project at the highest level, through (i) frequent PSC meetings, (ii) visits by the deputy prime minister to the project site, and (iii) timely provision of adequate counterpart funds.

33. The performance of MOE and BT is rated satisfactory as (i) they followed ADB procedures to procure goods, equipment, and consulting services; (ii) effectively managed and operated the imprest account; (iii) submitted progress reports and audited financial statements on time; and (iv) provided adequate counterpart funds on time. Procurement was initially delayed because MOE and BT did not understand ADB procedures.

## **K. Performance of the Asian Development Bank**

34. Since this was the first ADB-financed emergency project<sup>8</sup> by MOE and BT, ADB provided MOE with training, close administration, and regular monitoring. ADB facilitated a seminar for project staff on project administration in November 2003. This was followed by hands-on training of MOE staff, particularly in project procurement and administration. Additional hands-on training was provided during the 13 review missions during October 2002–October 2005, including a midterm review mission. ADB staff could complete the large number of review missions and extend a large amount of assistance to PIU staff because of continued operations in Tajikistan's energy sector.

35. During implementation, ADB acted promptly to address problems as they surfaced. Based on the above, ADB's performance is rated satisfactory.

## **III. EVALUATION OF PERFORMANCE**

### **A. Relevance**

36. Responding to the Government's request, ADB approved this rehabilitation assistance project. Its design was simple but appropriate for lowering the risk of blockage of the Vakhsh. The mountain slope has been stable despite several more earthquakes during the Project and bad weather. MOE and BT now has an observation and monitoring system in place, as well as the essential earthmoving equipment to manage emergencies. No major changes in design were required during the Project. The Project also provided a long-term solution that would greatly reduce the threat from a major earthquake and a resulting landslide. Thus, the Project achieved its goal and purpose and is considered highly relevant.

### **B. Effectiveness in Achieving Outcome**

37. The Project fully achieved its objective by stabilizing the slope that was active during the 3 March 2002 earthquake. The threat of blockage of the Vakhsh has decreased. The water discharge from BHPS and the pre-earthquake level of power and irrigation water supplies have been restored. ADB's close and constant project supervision trained MOE and BT staff in ADB procedures and guidelines. If the Government wants to further reduce the threat of river blockage (possible after a more powerful earthquake), it needs to find the resources to construct the bypass tunnel proposed under part B. Thus, the Project is rated effective in achieving its outcome.

### **C. Efficiency in Achieving Outcome and Outputs**

38. The project funds were used efficiently. The funds allocated for civil works were sufficient to complete the original outputs, and cost savings were used to implement additional works such as earthworks required after landslides in June 2004 and May 2005 (para. 16), and to pay for additional consulting services.

39. After completion of all stipulated works, the Project had a saving of \$663,395, including the cancellation of \$700,000 equivalent in September 2004 (para. 11). The uncommitted loan balance (\$700,000) was canceled well before the project completion date.

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<sup>8</sup> The first ADB-financed project was the Power Rehabilitation Project (Loan 1817-TAJ, approved for \$34 million [footnote 6]). However, procurement had not started when this emergency loan was implemented.

40. In view of the above, the Project is rated efficient in achieving the outcome and outputs.

#### **D. Preliminary Assessment of Sustainability**

41. The Project is likely to be sustainable. A higher intensity earthquake or adverse meteorological condition could still cause a landslide that could block the river. However, the availability of earthmoving equipment and an early warning system provide MOE the means to anticipate, and immediately reopen the river and prevent the creation of an unstable water reservoir.

#### **E. Impacts**

42. The Project was classified under environmental category B as it had some adverse environmental impacts. The key environmental issues included in the summary initial environmental examination were (i) no resettlement required, (ii) compensation to farmers for loss of cattle and fodder, (iii) effective soil and dust control during implementation, and (iii) environmental monitoring during implementation.

43. The Project did not result in any resettlement or land acquisition and encountered no indigenous issues. The Project did not restrict access to common property assets such as hay or cattle fodder. Positive social outcomes of the Project included (i) the rehabilitation of an access road to isolated villages and farms, (ii) extension of the electric grid to isolated farms in the neighborhood of the landslide, and (iii) modernization of springs in a remote village. Revegetation of the terraces has increased fodder for livestock and helped stabilize the slope to the river.

44. Based on these criteria, the environmental and sociocultural impacts are rated moderate. However, despite of the earthquake and the slide the gross domestic product in the Khatlon region grew by 14% and the poverty reduced by 13% during the period 1999-2003.

### **IV. OVERALL ASSESSMENT AND RECOMMENDATIONS**

#### **A. Overall Assessment**

45. The Project prevented severe disruption to the economy and poverty reduction (para. 4). The poverty data report<sup>9</sup> shows for the Khatlon region where the landslide is, poverty decreased by 13% and gross domestic product per capita increased by 16% during 1999–2003.

46. The Project was implemented largely as designed at appraisal (Appendix 7). The Project fully achieved its outcome and delivered its outputs using less funds than estimated. Implementation was delayed mainly by an adverse meteorological condition that was identified as a main project risk. Considering that the Project was rated highly relevant and efficacious, the loan funds were used efficiently, the sustainability of the benefits is likely, and the environmental and social impacts are moderate, the Project is rated successful.

#### **B. Lessons**

46. The Project demonstrated the following important lessons:

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<sup>9</sup> World Bank 2005. *Republic of Tajikistan. Poverty Assessment Update*. Washington DC.



- (i) Rigorous administration, close supervision, timely implementation of corrective measures, and frequent review missions are important, particularly when the executing and implementing agencies are not familiar with ADB procedures (para. 34).
- (ii) Strong ownership with the Government facilitated the timely release of counterpart funds and helped complete the Project without claims from the contractors.
- (iii) The civil works contractor should have paid more attention to preparing and implementing a safety plan that could have prevented the road accident.
- (iv) Warning systems and contingency plans enabled immediate and effective responses to subsequent tremors and landslides after the major event.

## **C. Recommendations**

### **1. Project Related**

47. **Future Monitoring.** Considering the large volume of earthworks under the Project, predominantly with loess soils, the stability of the Baipaza landslide area needs to be closely monitored. Special attention has to be given to formation of cavities, the stability of the cut sections, and drainage. Regular records and analyses of the rain station readings will help predict reactivation of the slide. Special attention also has to be paid to maintaining the access roads in operational condition in case the slide suddenly reactivates. MOE should follow the established procedures and emergency exercises to ensure that (i) the operation staff of BHPS and other specialists are fully aware of the course of action in case of an emergency, (ii) the earthmoving equipment remains parked close by the landslide, and (iii) all telecommunications equipment provided under the contract remain dedicated to the landslide operations.

48. **Covenants.** Most of the project covenants were appropriate and adequately complied with. Hence, the Loan Agreement covenants should be maintained.

49. **Further Action or Follow-Up.** The Project has been completed, loan accounts closed, and the undisbursed loan amount canceled. The Project has fully met its outcome and outputs.

50. **Additional Assistance.** If the threat of river blockage is to be minimized, construction of the diversion tunnel is recommended. It is estimated to cost \$32 million. This project may be developed as a public–private partnership within the framework of the 670 MW Sangtuda I and 200 MW Sangtuda II hydropower stations being implemented downstream of the Baipaza landslide. The diversion tunnel will considerably lower the hydrological risk for the new hydropower stations.

51. **Timing of the Project Performance Evaluation Report.** The project performance evaluation report may be carried out in mid-2007, after the emergency slope stabilization works have been subjected to a complete cycle of weather conditions.

## **2. General**

52. The relevant government agencies actively participated in project appraisal, which facilitated appropriate designs, allocation of sufficient funds, and contingency allocations. The implementation plan was somewhat optimistic and adverse meteorological conditions delayed implementation.

53. It is recommended that during the appraisal of similar emergency projects, the implementation schedule be realistic and allow enough time for the executing agency to gain familiarity with ADB's guidelines and procedures. The estimated time to complete civil works should allow for the effects of tremors, bad weather, and landslides.

54. During implementation, (i) when executing or implementing agencies lack capacity, a higher level of consulting services (domestic and international) for supervision of civil works may be required; and (ii) strong government leadership of project supervision is effective.

**PROJECT COST**  
**(Appraised and Actual)**  
(\$'000)

Item	Appraisal			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
<b>1. Base Cost</b>						
a. Part A						
i. Emergency Measures	287	3,000	3,287	239	2,656	2,895
ii. Disaster Preparedness	1,681	13	1,694	1,525	0	1,525
b. Part B: Feasibility Study	300	100	400	422	0	422
c. Taxes and Duties	0	700	700	0	567	567
<b>Total Base Cost</b>	<b>2,268</b>	<b>3,813</b>	<b>6,081</b>	<b>2,186</b>	<b>3,223</b>	<b>5,409</b>
<b>2. Contingencies</b>						
a. Physical Contingencies	52	401	453	0	0	0
b. Price Contingencies	19	34	53	0	0	0
<b>3. Interest During Construction</b>	65	0	65	60	0	60
<b>Total Project Cost</b>	<b>2,404</b>	<b>4,248</b>	<b>6,652</b>	<b>2,246</b>	<b>3,223</b>	<b>5,469</b>

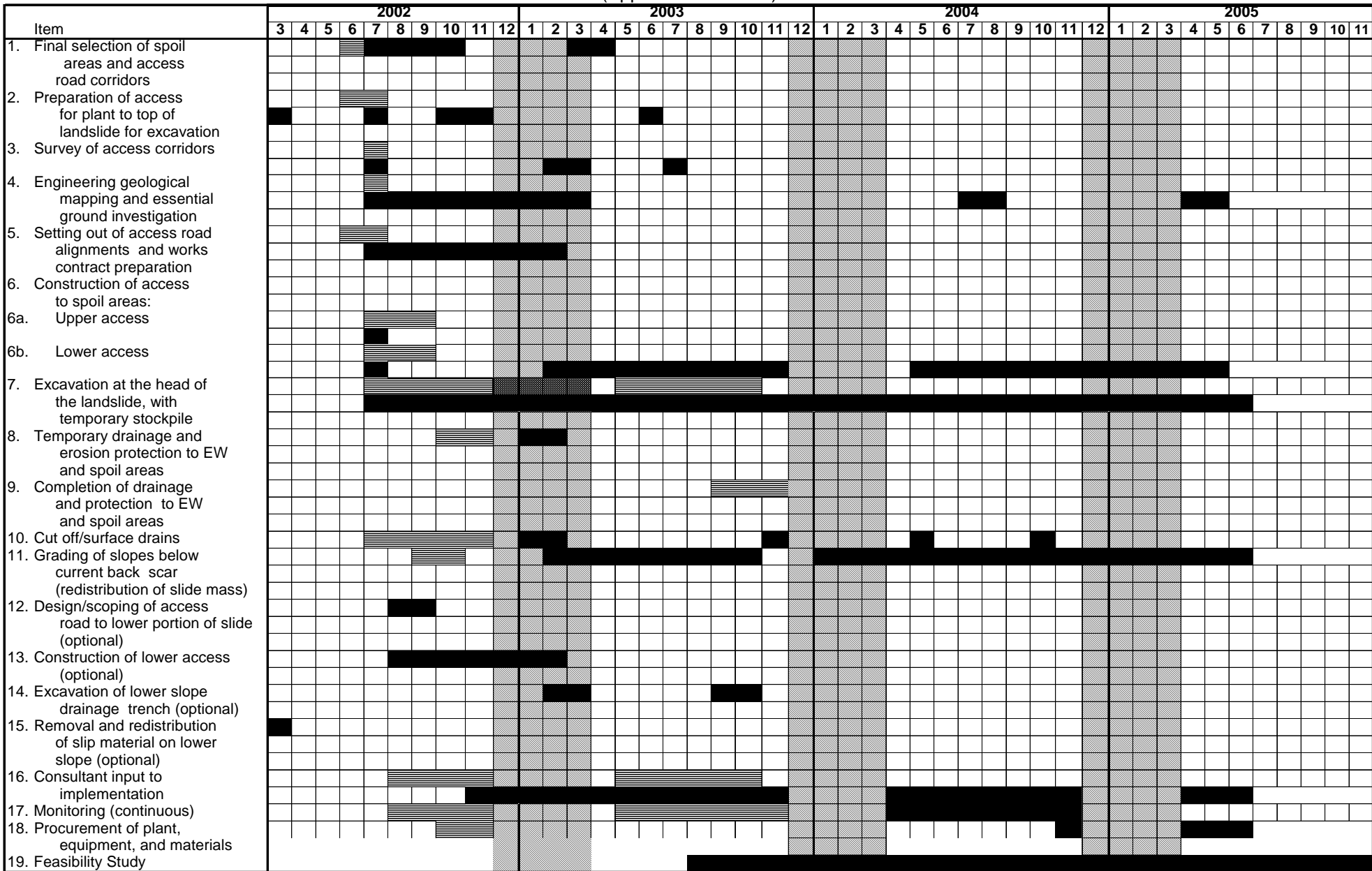
Source: Asian Development Bank estimates.

## DISBURSEMENT OF LOAN PROCEEDS BY COMPONENT

Components	ADB Financed (\$)		Total Cost
	Foreign Exchange	Local Currency	
<b>A. Emergency Measures</b>			
<b>1. Consulting Services</b>			
<b>a. International (Samuel Sapuay)</b>	<b>74,499</b>	<b>0</b>	<b>74,499</b>
<b>b. Domestic</b>			
i. Abdulhak, G.	0	26,600	26,600
ii. Aliev, K.	0	29,450	29,450
iii. Bakhodur, I.	0	8,000	8,000
iv. Donaboy, T.	0	4,800	4,800
v. Nikolay, I.	0	20,800	20,800
vi. Nurullo, R.	0	4,500	4,500
vii. Rustam, F.	0	28,600	28,600
viii. Uktam, M.	0	3,600	3,600
<b>2. Physical Works</b>			
a. Alidod Ltd.	0	5,960	5,960
b. Baipazinskaya	64,657	829,767	894,424
c. Shodmon	0	9,523	9,523
d. State Research Institute 'Giintiz'	0	17,443	17,443
e. State Research and Design Institute 'Hydroenergoproject'	6,942		6,942
f. Tades International	92,693	1,189,556	1,282,249
<b>Subtotal</b>	<b>238,791</b>	<b>2,178,599</b>	<b>2,417,390</b>
<b>B. Disaster Preparedness</b>			
<b>Equipment Supply</b>			
Baikal Group Inc.	2,350	0	2,350
Khazina	10,811	0	10,811
Lonestar Corporation	322,401	0	322,401
Marubeni Corporation	350,000	0	350,000
Orion	6,534	0	6,534
Ropa Group Corporation	816,000	0	816,000
T-rank	16,993	0	16,993
<b>Subtotal</b>	<b>1,525,089</b>	<b>0</b>	<b>1,525,089</b>
<b>C. Long-Term Solution</b>			
<b>Consulting Services</b>	422,476	0	422,476
<b>Subtotal</b>	<b>422,480</b>	<b>0</b>	<b>422,480</b>
<b>Total</b>	<b>2,186,288</b>	<b>2,178,599</b>	<b>4,364,887</b>

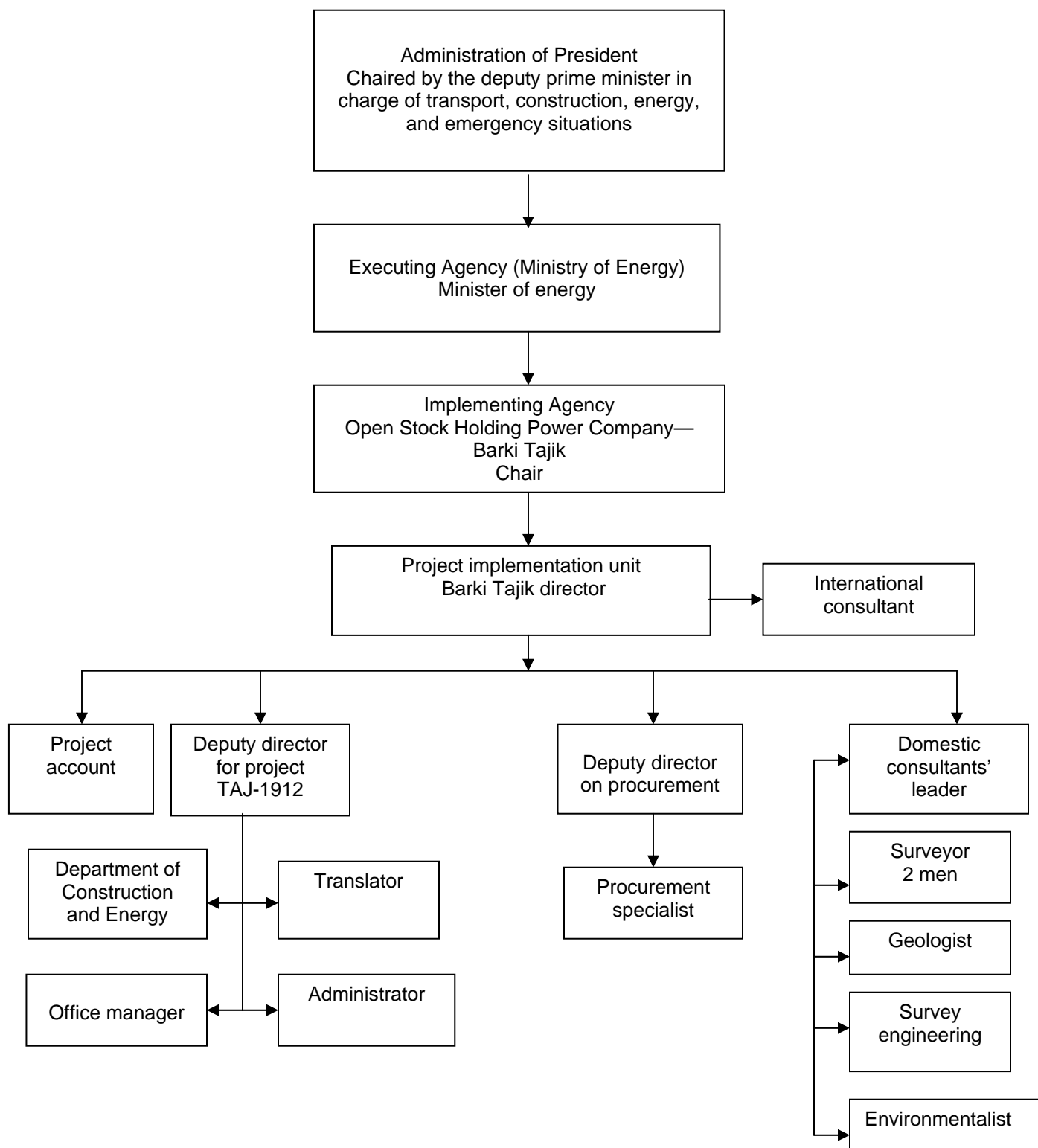
Source: Asian Development Bank

(Appraisal vs. Actual)



Source: Asian Development Bank estimates.

## ORGANIZATION CHART FOR PROJECT IMPLEMENTATION



### STATUS OF COMPLIANCE WITH MAJOR LOAN COVENANTS

Covenant	Reference to Loan Agreement	Status of Compliance
<p>The Borrower shall cause the proceeds of the Loan to be applied to the financing of expenditures on the Project in accordance with the provisions of this Loan Agreement</p>	<p>Article 3, section 3.01</p>	<p>Complied with.</p>
<p>The goods and services and other items of expenditure to be financed out of the proceeds of the loan and the allocation of amounts of the loan among different categories of such goods and services and other items of expenditure shall be in accordance with the provisions of Schedule 3 of the Loan Agreement, as such Schedule may be amended from time to time by agreement between the Borrower and ADB.</p>	<p>Article 3, section 3.02</p>	<p>Complied with.</p>
<p>Except as ADB may otherwise agree, the Borrower shall cause all goods and services financed out of the proceeds of the loan to be used exclusively in the carrying out of the Project.</p>	<p>Article 3, section 3.04</p>	<p>Complied with.</p>
<p>Withdrawals from the loan account in respect of goods and services shall be made only on account of expenditures relating (a) goods which are procured in and supplied from and services which are supplied from such member countries of ADB as shall have been specified by ADB from time to time as eligible sources for procurement; and (b) goods and services which meet such other eligibility requirements as shall have been specified by ADB from time to time.</p>	<p>Article 3, section 3.05</p>	<p>Complied with.</p>
<p>The closing date of withdrawals from the loan account for the purposes of Section 8.03 of the Loan Regulations shall be 31 May 2004 or such other date as may from time to time be agreed between the Borrower and ADB.</p>	<p>Article 3, section 3.06</p>	<p>Complied with. The project accounts were closed on 20 December 2005 and the undisbursed amount of \$663,395 was cancelled on 20 December 2005.</p>
<p>The Borrower shall cause the project to be carried out with due diligence and efficiency and in conformity with sound administrative, financial, engineering, and environmental and public utility practices.</p>	<p>LA Article 4, section 4.01. (a)</p>	<p>Generally complied with. Delays of 19 months in implementation.</p>
<p>The Borrower shall make available, promptly as needed, the funds, facilities, services, land and other resources,</p>	<p>LA Article 4, section 4.02.</p>	<p>Complied with, however delays</p>

<b>Covenant</b>	<b>Reference to Loan Agreement</b>	<b>Status of Compliance</b>
which are required, in addition to the proceeds of the Loan, for the carrying out the Project and the operation and maintenance of the Project facilities.		in the designs were encountered.
<p>In the carrying out of the Project, the Borrower shall cause competent and qualified consultants and contractors, acceptable to the Borrower and ADB, to be employed to an extent and upon terms and conditions satisfactory to the Borrower and ADB</p> <p>The Borrower shall cause the Project to be carried out in accordance with plans, design standards, specification, work schedules and construction methods acceptable to the Borrower and ADB. The Borrower shall furnish, or cause to be furnished, to ADB, promptly after their preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB shall reasonable request.</p> <p>The Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.</p> <p>The Borrower shall make arrangements satisfactory to ADB for insurance of the Project facilities to such extent and against such risks and in such amounts as shall be consistent with sound practice.</p> <p>Without limiting the generality of the foregoing, the Borrower undertakes to insure, or cause to be insured, the goods to be imported for the Project and to be financed out of the proceeds of the Loan against hazards incident to the acquisition, transportation and delivery thereof to the place of use or installation, and for such insurance any indemnity shall be payable in currency freely usable to replace or repair such goods.</p> <p>The Borrower shall maintain, or cause to be maintained, records and accounts adequate to identify the goods and services and other items of expenditure financed out of the proceeds of the Loan, to disclose the use thereof in the Project, to record the progress of the Project (including the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, the operations and financial condition of the agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof.</p>	<p>LA Article IV, section 4.03. (a)</p> <p>LA Article IV, section 4.03. (b)</p> <p>LA Article IV, section 4.04.</p> <p>LA Article IV, section 4.05. (a)</p> <p>LA Article IV, section 4.05. (b)</p> <p>LA Article IV, section 4.06. (a)</p>	<p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with. Breakdown of project expenditures were made available.</p>



Covenant	Reference to Loan Agreement	Status of Compliance
<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 statement and the report of the auditors related 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 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>	<p>LA Article IV, section 4.06. (b)</p>	<p>Complied with. Separate accounts were kept and audited. Project accounts were submitted on time.</p>
<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 that any such discussion shall be conducted only in the presence of an authorized officer of the Borrower unless the Borrower shall otherwise agree.</p>	<p>LA Article IV, section 4.06. (c)</p>	<p>Complied with.</p>
<p>The Borrower shall furnish, or shall cause to be furnished, to ADB all such reports and information as ADB shall reasonably request concerning (i) the Loan, and the expenditure of the proceeds and maintenance of the service thereof; (ii) the goods and services and other items of expenditure financed out of the proceeds of the Loan; (iii) the Project; (iv) the administration, operations and financial condition of the agencies of the Borrower responsible for the carrying out of the Project and operation of the Project facilities, or any part thereof; (v) financial and economical conditions in the territory of the Borrower and the international balance-of-payments position of the Borrower; and (vi) any other matters relating to the purpose of the Loan.</p>	<p>LA Article IV, section 4.07. (a)</p>	<p>Complied with.</p>
<p>Without limiting the generality of the foregoing, the Borrower shall furnish, or cause to be furnished, to ADB quarterly reports on the carrying out of the Project and on the operation and management of the Project facilities. Such reports shall be reasonably request, and shall indicate, among other things, progress made and problems encountered during the quarter under review,</p>	<p>LA Article IV, section 4.07. (b)</p>	<p>Generally complied with. Some delays in the submission of quarterly progress reports were recorded.</p>

Covenant	Reference to Loan Agreement	Status of Compliance
steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.		
Promptly after physical completion of the Project, but in any event not later than three (3) months thereafter or such later date as may be agreed for this purpose between the Borrower and ADB, the Borrower shall prepare and furnish to ADB a report, in such form and in such detail as ADB shall reasonable request, on the execution and initial operation of the Project, including its cost, the performance by the Borrower of its obligations under this Loan Agreement and the accomplishment of the purposes of the Loan.	LA Article IV, section 4.07. (c)	Complied with. ADB received MOE's PCR on 21 November 2005.
The Borrower shall enable ADB's representatives to inspect the Project, the goods financed out of the proceeds of the Loan, and any relevant records and documents.	LA Article IV, section 4.08.	Complied with.
The Borrower shall ensure that the Project facilities are operated, maintained and repaired in accordance with sound administrative, financial, engineering, environmental, and maintenance and operational practices.	LA Article IV, section 4.09.	Complied with.
It is the mutual intention of the Borrower and ADB that no other external debt owed a creditor other than ADB shall have any priority over the Loan by way of a lien on the assets of the Borrow. To that end, the Borrower undertakes (i) that, except as ADB may otherwise agree, if any lien shall be created on any assets of the Borrower as security for any external debt, such lien will ipso facto equally and ratably secure the payment of the principal of, and interest charge and any other charge on, the Loan; and (ii) that the Borrower, in creating or permitting the creation of any such lien, will make express provision to that effect.	LA Article IV, section 4.10. (a)	Complied with.
The provisions of paragraph (a) of this Section shall not apply to (i) any lien created on property, at the time of purchase thereof, solely as security for payment of the purchase price of such property; or (ii) any lien arising in the ordinary course of banking transactions and securing a debt maturing not more than one year after its date.	LA Article IV, section 4.10. (b)	Complied with.
The term "assets of the Borrower" as used in paragraph (a) of this Section includes assets of any political subdivision or any agency of the Borrower and assets of any agency of any such political subdivision, including the National Bank of Tajikistan and any other institution performing the functions of a central bank of the Borrower.	LA Article IV, section 4.10. (c)	Complied with.

Covenant	Reference to Loan Agreement	Status of Compliance
<p>The Project Executing Agency shall be MOE. MOE shall be responsible for overall implementation of the Project</p>	<p>LA, schedule 6, para. 1</p>	<p>Complied with. MOE acted as EA for the Project</p>
<p>The Project Implementing Agency shall be BT. The Borrower shall ensure that the PIU established in BT shall be staffed with local experts in procurement, geology, geodesy, civil engineering, and accounting. The PIU shall be responsible for (i) the day-to-day implementation of the Project, including approval of design, preparation and evaluation of tenders, award of contracts, and procurement of materials and equipment; (ii) recruitment and supervision of the consultants; (iii) supervision of implementation and quality control of project works; and (v) maintenance of accounts for the Project and for its overall operations and preparation of reports and communications with ADB.</p>	<p>LA, schedule 6, para. 2</p>	<p>Complied with. The PIU was established promptly and staffed satisfactorily.</p>
<p>The Borrower shall ensure that a Project Steering Committee (PSC) acceptable to ADB has been established within 1 month of the effective date. The PSC shall ensure overall coordination for the Project and shall review implementation progress, identify any project implementation issues, determine measures to address these issues and provide guidance to MOE and BT. The PSC shall be chaired by the Deputy Prime Minister in charge of the Ministries of Transport, Trade, Construction, Energy, Industry and Emergency Situations, and shall include senior-level representatives from MOE, MOF, BT, and the Ministry of Environment. The PSC shall meet once every quarter, or more frequently, if required.</p>	<p>LA, schedule 6, para. 3</p>	<p>Complied with. The PSC was established promptly and it met more frequently than envisaged.</p>
<p>Without limiting the generality of Section 3.02 of this Loan Agreement, the Borrower shall ensure that all funds and resources necessary for the Project are provided on a timely basis.</p>	<p>LA, schedule 6, para. 4</p>	<p>Complied with. No shortfall in the availability of counterpart funds.</p>
<p>Without limiting the generality of Section 4.02 of this Loan Agreement, the Borrower shall ensure that sufficient funds and allocated for operation and maintenance of the project facilities during and after the project implementation period.</p>	<p>LA, schedule 6, para. 4</p>	<p>Complied with. The Project has been handed over to BT Baipaza HPP for OM.</p>
<p>The Borrower shall ensure that no involuntary resettlement or acquisition of land takes place during project implementation. In the event that project implementation results in the loss of access to common property assets such as hay or cattle fodder from areas adjacent to the Baipaza landslide, the Borrower shall</p>	<p>LA, schedule 6, para. 6</p>	<p>Complied with. No resettlement or acquisition of land took place during implementation.</p>

Covenant	Reference to Loan Agreement	Status of Compliance
ensure that the affected persons are compensated at replacement cost in a manner acceptable to ADB.		In addition, the Project did not impose restriction of access to common property such as hay or cattle fodder.
<p>The Borrower shall ensure that the Project is carried out, and all project facilities are operated and maintained, in accordance with the existing laws, regulations and standards of the Borrower concerning environmental protection and ADB's environmental guidelines, in particular, ADB's environmental guidelines for selected infrastructure projects. The Borrower shall also ensure that all necessary environmental approvals and clearances, as required under the relevant laws and regulations of the Borrower, are obtained in a timely manner, including the Initial Environmental Examination (IEE) dated 25 June 2002 is approved by the necessary authorities of the Borrower prior to the effective date. The Borrower shall also ensure that the environmental mitigation measures set forth in the IEE are carried out under the Project.</p> <p>The Borrower and ADB shall jointly carry out a midterm review of the Project following the end of the first construction season in November 2002. The midterm review shall assess, inter alia, (i) implementation status, (ii) design and construction standards, (iii) physical progress achieved and disbursements made in relation to the implementation schedule, (iv) performance of the consultants and contractors, and (v) status of compliance with the assurances stipulated in this Loan Agreement. The midterm review shall also assess the need for any additional work or changes to the project scope to take account of any further loss, damage or other landslide/earthquake-related consequences.</p>	<p>LA, schedule 6, para. 7</p> <p>LA, schedule 6, para. 8</p>	<p>Partly complied with. While the Project addressed most of the environmental issues, it failed to undertake an environmental monitoring plan as specified in the SIEE.</p> <p>Complied with. Midterm review mission took place on 5–12 December 2002.</p>

ADB = Asian Development Bank, BT = Barki Tajik, EA = executing agency, LA = loan agreement, MOE = Ministry of Energy, MOF = Ministry of Finance, OM = operations manual, PCR = project completion report, PIU = project implementation unit, SIEE = summary initial environmental examination.

## DETAILS OF MAJOR CONTRACT PACKAGES

Component	Description	Contract Amount	Actual Dates		Mode of Procurement
			Start	Completion	
A. Emergency Measures					
1. Works Contracts					
Alidod	Topographic and geodetic works	TJS18,857.15	2 Feb 2004	31 Jul 2004	LCB
Shodmon	Geodesic monitoring	TJS25,538.60	1 Aug 2004	31 Dec 2004	DN
Giintiz	Geodetic and topographic survey	TJS43,749.00	25 Jun 2004	07 Mar 2005	DN
Hydroenergoproject	Assessment of additional works for landslide that occurred in June 2004	\$7,000.00	20 Jun 2004	31 May 2005	DN
Consulting Services	Domestic (8 persons)	\$126,350.00	4 Nov 2002	30 Jun 2005	DN
Consulting Services	International (1 person)	\$95,205.00	16 Apr 2003	30 Jun 2005	DN
2. Earth Works					
Baipazinskaya	General contractor for civil works	TJS3,970,185.48	10 Mar 2002	14 Nov 2003	FAW/DS
Tades	New contractor for civil works	\$1,592,042.09	15 Nov 2003	30 Jun 2005	LCB
B. Disaster Preparedness					
Equipment					
Ropa Group	Excavator – 2 units; Bulldozer – 1 unit	\$816,000.00	21 Feb 2003	21 Aug 2003	IS
Baikal Group	GPS equipment	\$2,350.00	14 Mar 2003	14 Jul 2003	IS
Marubeni	Bulldozer - 225 HP	\$350,000.00	23 Jun 2003	23 Sep 2003	IS
Lonestar Corp.	All terrain crane – 50 ton	\$322,401.34	28 Nov 2003	28 Feb 2004	IS
Khazina LLC	Field equipments for local consultants	\$11,560.00	4 Mar 2004	31 Dec 2004	DP
Orion	Rain gauge instrument	\$6,534.00	16 Jun 2005	30 Aug 2005	DN
T-Rank	Communication equipment	\$16,992.80	30 May 2005	26 Sep 2005	LCB
C. Long-Term Solution					
Feasibility Study					
	Feasibility Study for maintenance of river flow at Vakhsh River	\$422,480.00	20 Aug 2003	30 Nov 2005	ICB

DN = direct negotiation, DP = direct purchase, DS = direct selection, FAW = force account works, ICB = international competitive bidding, IS = international shopping, LCB = local competitive bidding.

Sources: Asian Development Bank and Barki Tajik

## INTERNATIONAL AND DOMESTIC CONSULTING CONTRACTS PACKAGES

Contract No.	Expertise	Start Date of Services	End Date of Services	Total Person-Months (Appraisal)	Total Person-Months (Actual)	Monthly Rate (\$)	Amount of Contract (\$)
0002	Samuel Sapuay International Consultant	16-Apr-03	30-Jun-05	4	3	12,000.0	95,205.0
0011	F. Rustam Team Leader/Civil Engineer	4-Nov-02	31-Dec-04	14	26	1,100.0	28,600.0
0005	T. Donaboy Land Surveyor	04-Nov-02	31-Dec-03	6	6	800.0	4,800.0
0015	I. Bakhodur Land Surveyor	01-Jan-04	30-Jun-05		10	800.0	8,000.0
0006	G. Abdulhak Inspector of Works	04-Nov-02	30-Apr-05	10	28	950.0	26,600.0
0007	K. Aliev Inspector of Works	04-Nov-02	30-Jun-05	11	31	950.0	29,540.0
0008	M. Uktam Environmentalism	04-Nov-02	31-Dec-03	4	4	900.0	3,600.0
0016	R. Nurullo Environmentalism	15-Mar-04	15-Apr-05		5	900.0	4,500.0
0009	I. Nikolay Geologist	4-Nov-02	31-Dec-04	16	26	800.0	20,800.0

Source: Barki Tajik, Tajikistan

## PROJECT FRAMEWORK

Design Summary	Performance Targets		Data Source	Assumption and Risks
	Appraisal	Actual		
<b>Impact</b> Avoid severe disruption to the economic development of Tajikistan and to the Government's poverty reduction program	Economic growth maintained  Poverty reduction program continued	GDP grew by 10.2% in 2003 and 10.6% in 2004.  Poverty reduced from 82% in 1999 to 63% in 2003.  In Khatlon Region GDP per capita grew by 14% and poverty reduced by 13% in 1999–2003	Tajikistan CSPU  World Bank 2005 Poverty Assessment Update	Favorable economic environment Continuation of policy reforms
<b>Outcome</b> Minimized the occurrence and magnitude of the landslide  Addressed the effects of a landslide and limit the blockage of the Vakhsh River  Restored the initial level of reliability of power and irrigation water supplies	Following the implementation of the Project by 2003, to avoid and/or minimize occurrence of <ul style="list-style-type: none"> <li>• disruption to power output,</li> <li>• disruption of irrigation cropping,</li> <li>• catastrophic flooding,</li> <li>• dam break with widespread destruction, and</li> <li>• disruption of water supply in the downstream areas</li> </ul>	<ul style="list-style-type: none"> <li>• Landslide has been stabilized.</li> <li>• No blockage of the Vakhsh River was recorded.</li> <li>• Initial level of power and drinking water supplies have been achieved.</li> </ul>	BT  BT  BT	<ul style="list-style-type: none"> <li>• Implementation of long term solution will remove the threat of blockage of the Vakhsh River and will ensure reliability of power as well as irrigation and water supplies</li> <li>• No adverse weather/earthquake conditions</li> <li>• Landslide being closely monitored</li> </ul>
<b>Outputs</b>  <ul style="list-style-type: none"> <li>• Enhanced ability to clear the riverbed</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of up to 30 km of access road from June to August 2002</li> </ul>	<ul style="list-style-type: none"> <li>• 48.5 km of road were built by June 2003.</li> <li>• All plants and disaster preparedness system have been procured by June 2005</li> </ul>	BT completion report	

Design Summary	Performance Targets		Data Source	Assumption and Risks
<b>Outputs</b> <ul style="list-style-type: none"> <li>• Improvements to slope stability</li> <li>• Clearance of the riverbed</li> <li>• The preferred long-term solution</li> </ul>	<ul style="list-style-type: none"> <li>• Earthworks to improve stability involving 0.8 million m<sup>3</sup> of excavation; implementation from August 2002 to November 2003</li> <li>• 2 km of slope drainage; implementation from August to November 2002</li> <li>• Prepare cost-effective long-term solution plan</li> </ul>	<ul style="list-style-type: none"> <li>• 0.73 million m<sup>3</sup> have been evacuated from August 2002 to December 2004.</li> <li>• 1.6 km of slope drainage completed in November 2003.</li> <li>• 157,289 m<sup>2</sup> of benched-cut areas were re-vegetated in April 2005</li> <li>• Riverbed was cleared allowing a water flow of more than 1,600m<sup>3</sup>/s by December 2002</li> <li>• Feasibility study for a long term solution completed in November 2005</li> </ul>	<ul style="list-style-type: none"> <li>BT completion report</li> <li>BT completion report</li> <li>BT completion report</li> <li>BT completion report</li> <li>BT completion report</li> </ul>	



Activities – Milestones	Inputs
<b>1.0 Emergency Slope Stabilization and Disaster Preparedness</b> 1.1 Survey and investigation 1.1.1 Design 1.1.2 Road construction and improvement  1.1.3 Earthworks 1.1.4 Drainage <b>1.2 Disaster Preparedness Measures</b> 1.2.1 Procurement of earthmoving equipment 1.2.2 Procurement of a 50 tons crane 1.2.3 Procurement of early warning system <b>2.0 Long-Term Solution</b>	Contract award Recruitment of consultant ADB approval of bidding documents Bid invitation Evaluation of bids         Recruitment of consultants Geophysical surveys

Source: Asian Development Bank

BT= Barki Tajik, GDP = Gross Domestic Product, CSPU = Country Strategy and Programming Update, km = kilometer, m<sup>2</sup> = square meter, m<sup>3</sup> = cubic meter, m<sup>3</sup>/s = cubic meter per second.