ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 31197
October 2008

Proposed Supplementary Asian Development Fund Grant
Kyrgyz Republic: Community-Based Infrastructure Services Sector Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 25 August 2008)

Currency Unit	–	som (Som)
Com1.00	=	$0.028
$1.00	=	Som34.69

The exchange rate for the som is determined at regular auctions for foreign exchange conducted by the National Bank of the Kyrgyz Republic. For calculations in this report, the rate used is $1.00 = Som34.69, the rate prevailing at appraisal.

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
BCR	–	benefit–cost ratio
CDU	–	community development unit
CDWUU	–	community drinking water users' union
DFID	–	Department for International Development of the United Kingdom
DRWS	–	Department of Rural Water Supply
EA	–	executing agency
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
EOCC	–	economic opportunity cost of capital
FIRR	–	financial internal rate of return
IEE	–	initial environmental examination
MOU	–	memorandum of understanding
NALSG	–	National Agency of Local Self-Government
NGO	–	nongovernment organization
O&M	–	operation and maintenance
PIU	–	project implementation unit
PMU	–	project management unit
SPI	–	summary price index
WACC	–	weighted average cost of capital
WSS	–	water supply and sanitation

NOTES

(i) The fiscal year of the Government ends on 31 December.
(ii) In this report, "$" refers to US dollars.

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SUPPLEMENTARY APPENDIXES

SUPPLEMENTARY GRANT AND PROJECT SUMMARY

Recipient	Kyrgyz Republic
Project Description	The Community-Based Infrastructure Services Sector Project (the Project) follows a sector lending approach and supports the main objective of the Government of the Kyrgyz Republic of human development by providing (i) improved community-based infrastructure services, and (ii) training programs to develop institutional capacity. The project area covers four *oblasts* (provinces)—Chui, Jalal-Abad, Osh, and Batken. The Project was designed to provide basic infrastructure services in 730 villages and seven small towns to about 1.5 million persons, of whom approximately 70% were living below the poverty line. The proposed supplementary grant is required to meet the financing gap that has emerged due to significant increases in construction costs during the implementation period. As a result, the water supply systems in 118 subprojects were prioritized out of the originally planned 240 subprojects. The proposed supplementary grant will finance the implementation of the remaining 122 subprojects by providing much-needed water supply and sanitation services for the rural population as prioritized by the Government. Based on the lessons from the Project, proposed changes include (i) simplification of the subproject selection criteria to ensure the selection of community-owned, demand-driven, and cost-effective subprojects; (ii) improvement of technical design criteria for implementing simple, technically sound, and cost-effective subprojects; and (iii) improvement of implementation arrangements to achieve efficiency and quality during project implementation.
Classification	Targeting Classification: General intervention Sector: Water supply, sanitation, and waste management Subsector: Water supply and sanitation Theme: Inclusive social development Subtheme: Human development
Environmental Assessment	Category B. An initial environmental examination was undertaken.
Rationale for Supplementary Grant	The increase in construction costs are attributed to two things. Firstly, an unexpected surge in the price of the following commodities—steel, cement, pipes, and petroleum products. Consequently, the average per capita cost of construction of water supply infrastructure increased from $20 to $80 between the period of the initial project design and contract awards. Secondly, climatic changes and droughts limited the use of springs and groundwater sources located close to villages, and thus the networks had to be connected to distant water sources. Consequently, the overall scale and cost of

subprojects increased dramatically.

Despite cash and in-kind contributions solicited from many communities, total funding provided under the Project was inadequate to meet the original target. Unless additional funding is provided, many communities which had high expectations of benefiting from the Project will remain without safe water supply and sanitation.

The proposed supplementary grant will finance the implementation of the remaining 122 subprojects and address the critical water supply and sanitation problems of about 300,000 people who could not be covered under the initial Project. The supplementary grant will also cover all the identified rectification works and include the procurement of much-needed operation and maintenance tools for sustainable operations.

The World Bank and Department for International Development of the United Kingdom (DFID)-assisted Rural Water and Sanitation Project for the remaining three provinces of the Kyrgyz Republic is scheduled for completion by the end of 2008. That project also experienced large price escalations and the World Bank and DFID are jointly considering additional financing in order to meet the planned benefits and impacts.

The Project was scheduled to close in December 2006 but, due to start-up delays of about 2 years, the loan closing date was extended to 31 December 2008. Overall progress of the Project until 2005 had been slow and, due to weak performance of the project management unit and the consultants, the quality of works in some subprojects needed improvement. The Government rectified the situation by replacing the entire project team. The new team streamlined the project implementation by working on the rectification of previous subprojects, which is currently ongoing, and also completing the remaining new subprojects. To further ensure the quality of all the subprojects in line with the communities' requirement, in 2008 the Asian Development Bank (ADB) conducted an extensive field survey of a large number of completed and ongoing subprojects and provided specific solutions to the Government for rectifying all major or minor problems. The Project will be completed by the end of 2008.

Based on the lessons learned, both from ADB and the World Bank and DFID-assisted projects, subproject selection criteria and engineering design criteria have been improved, which will ensure selection of strictly demand-driven subprojects, and use of simple, technically sound, and cost-effective approaches. The improved implementation arrangements include mandatory steps to ensure community involvement at all stages, including identification, selection, planning, design, and implementation of subprojects. A new team of technical supervision consultants will finalize the detailed engineering design of the subprojects in light of the modified selection

	and design criteria, and provide project management and implementation support. In addition to safe drinking water supply, the supplementary grant will (i) focus on rural sanitation, (ii) expand the hygiene education program, and (iii) ensure intensive training of community organizations on sound financial management and operation and maintenance practices is undertaken.
Revised Investment Plan	The revised cost for the Project, including the cost of the initial loan ($36 million), the proposed supplementary grant ($30 million), and the total counterpart sharing ($16.5 million), is estimated at $82.5 million including taxes and duties, physical and price contingencies, and financing charges during implementation.
Revised Financing Plan	Under the revised financing arrangements, the total ADB financing will cover 80% of the investment costs. The Government and communities will jointly finance 20% of the project cost.
Supplementary Grant Amount and Terms	ADB will provide a grant of $30 million from its Special Funds resources. Based on debt sustainability analysis and the revised Asian Development Fund grants framework, the Kyrgyz Republic is eligible for 100% grant financing during 2007–2008.
Project Completion Date	31 December 2012
Utilization Date	30 June 2013
Implementation Arrangements	Existing implementation arrangements have been modified to improve project implementation by shifting the responsibility from the Ministry of Agriculture, Water Resources and Processing Industry to the Department of Rural Water Supply (DRWS), which will now serve as the executing agency. The existing project management unit (PMU) at DRWS will continue to provide overall coordination. The National Agency for Local Self-Government and the project implementation units already established at oblast level will jointly implement the activities under the supplementary grant.
Project Benefits and Beneficiaries	The supplementary grant is expected to benefit about 200 villages with an estimated population of about 300,000 people. It will finance improvements to living standards, the environment, and public health. Related benefits include time and cost savings from purchasing, fetching, treating, and storing water; improved hygiene and health; reduced medical outlays; and increased productive days. It will also support improvements in operational efficiency of the community-based organizations.
Risks and Assumptions	Four possible project risks have been identified: (i) turnover of existing staff of the PMU can adversely affect the quality and efficiency of work and thus delay the project implementation, (ii) poor selection of contractors at any time during the implementation could

hamper the project quality and consequently community members might withdraw from their commitment to take over the operation and maintenance (O&M) of the subprojects, (iii) selected sources of water supply might turn out to be unsustainable, and (iv) the Project may become unsustainable if tariffs are not periodically increased. The Project includes the following measures to mitigate these risks.

The Government shall endeavor that no staff transfers take place during the project implementation and the PMU and PIUs capacity will be further strengthened as per agreed staffing strength. To ensure the selection of qualified contractors, the performance of existing contractors will be reevaluated to qualify only those contractors who have performed well during the initial project implementation. Further, a more stringent criterion will be applied for the prequalification of new contractors. For the selection of sustainable water sources, improved guidelines for undertaking comprehensive investigations have been agreed that will ensure the desired water yield from the selected water supply sources. Involvement of communities in the identification and selection of sources and the overall implementation will ensure their ownership and minimize the risk of subprojects being unsustainable. The Government has also assured that the *ayil okmotus* (village administrations) as mandated by law, will ensure the community drinking water users' unions (CDWUUs) revise tariffs periodically to meet operation and maintenance costs of subprojects. Where required, the ayil okmotu will provide financial support to CDWUUs and ensure that service is efficiently delivered and the system does not experience breakdown.

Kyrgyz Republic Map

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed supplementary grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project.

II. THE APPROVED PROJECT

A. Project Rationale

2. Prior to 1991, the Soviet Union provided sufficient subsidies to construct, rehabilitate, and maintain infrastructure services throughout the country. While preparing the Project, it was recognized that the Government of the Kyrgyz Republic does not have the financial capability to provide the necessary funds, nor the institutional arrangements to make the best use of available limited resources; infrastructure in both urban and rural areas had deteriorated.

3. Rural water supply had been particularly badly affected. Formerly, an estimated 70% of rural villages had a clean, healthy piped water supply. This coverage officially dropped to 60% during the preparation of the Project. The southern poor *oblasts* (provinces) of Jalal-Abad and Osh were badly affected, and only about 25% of the villages had reliable water supply. Statistics on morbidity and mortality in the Kyrgyz Republic indicated that, while the mortality rate declined somewhat because of improvements in basic health services, the morbidity rate continued to increase. Diarrheal diseases strongly associated with unsafe water supply and poor sanitation and hygiene were among the leading causes of morbidity, with an incidence rate of about 425 per 100,000 people in 1998. Similarly, cases of typhoid increased each year since 1995, and in 1998 an outbreak in Osh and around Bishkek due to polluted water sources resulted in an almost fourfold increase over 1997.

4. The lack of adequate water supply and sanitation services has a large negative impact on the social economy of the country, and especially on the poor. There exists a direct link between the deterioration of these services and the increase of waterborne and excreta-related diseases during the 1990s. Having to cope with poor and unsafe water and sanitation services results in large financial and social costs for the poor population. Some can afford to spend resources on alternative methods to provide a centralized water supply, but in rural areas people often walk long distances only to obtain contaminated water from untreated sources. Many villages contain *banyas* (communal bathhouses), which have now largely fallen into disuse due to lack of water supply. One of the results is an increase in skin complaints caused by lack of proper cleanliness. There is no wastewater collection system in rural areas or an acceptable level of human waste disposal. Improving the water supply and sanitation sector's performance is an integral part of the Government's poverty reduction strategy.

5. The Community-Based Infrastructure Services Sector Project (the Project)[1] follows a sector lending approach and supports the Government's objectives of decentralization, poverty reduction, and human development.

[1] ADB, 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project*. Manila.

B. Objectives and Scope

6. The main objective of the Project was to improve the living and health conditions in selected rural and urban communities, in particular for the poor, through the provision of basic infrastructure services. The Project aimed to achieve its objective by (i) assisting the central and local governments in delivering infrastructure services; (ii) supporting sanitation and hygiene education; (iii) improving the technical and financial capacity of local governments in the planning, implementation, and operation and maintenance (O&M) of facilities; and (iv) promoting ownership and community management of both rural and urban community-based infrastructure services. The project impact and outcome was to improve public health and environment in project villages and focus on (i) increasing safe water coverage from the existing 32% of the population to 100%, and (ii) reducing the incidence of waterborne diseases from 30% of the population to 5% over the project period.

7. The Project included two parts: part A, physical infrastructure; and part B, capacity building:

(i) Part A included about 240 subprojects in about 730 villages, and 7 subprojects in 7 towns. The rural subprojects were to cover the rehabilitation and upgrade of piped drinking water supply systems, the establishment and upgrade of sanitation facilities and flood control and drainage facilities, and the rehabilitation of local roads in conjunction with investments in water supply. The urban subprojects were to cover rehabilitation and extension of piped water supply services, and improved sewerage systems including wastewater collection and treatment.

(ii) Part B included an institutional development program, a hygiene and sanitation education program, and consulting services for project management support.

C. Initial Cost Estimates and Financing Plan

8. The total cost of the Project was estimated at $45 million equivalent, including taxes and duties, as well as physical and price contingencies. The Asian Development Bank (ADB) loan approved for the Project was $36.0 million equivalent to finance 80% of the total project cost. The balance of $9.0 million equivalent, or about 20% of the total cost, was financed by the beneficiary communities ($3.0 million), the oblast and *rayon* (district) administrations ($0.5 million), and the central Government ($5.5 million). Government financing covered local expenditures including taxes and duties. The foreign exchange risk was borne by the Government. The loan was provided from ADB's Special Funds resources and had the following terms: an amortization period of 32 years including a grace period of 8 years, and an interest charge of 1% per annum during the grace period and 1.5% per annum thereafter. A summary of the cost estimates is provided in Table 1 and the financing plan is in Table 2.

Table 1: Summary of Initial Project Cost Estimates
($ million)

Item	Foreign Currency	Local Currency	Total Cost	Share of Total (%)
A. Physical Infrastructure				
1. Rural Water Supply	9.8	14.1	23.9	53
2. Rural Sanitation	1.2	1.5	2.7	6
3. Rural Flood Control	0.2	0.5	0.7	2
4. Rural Local Roads	0.3	0.7	1.0	2
5. Urban Water Supply	2.9	2.9	5.8	13
6. Urban Sewerage	2.6	2.2	4.8	11
Subtotal (A)	**17.0**	**21.9**	**38.9**	**86**
B. Capacity Building				
1. Institutional Dev Program	0.1	1.0	1.1	2
2. Hygiene and Sanitation Education Program	0.0	0.4	0.4	1
3. Consulting Services for Project Management	1.9	0.8	2.7	6
Subtotal (B)	**2.0**	**2.2**	**4.2**	**9**
C. Interest During Construction	**1.9**	**0.0**	**1.9**	**4**
Total (A+B+C)	**20.9**	**24.1**	**45.0**	**100**

Source: Asian Development Bank estimates.

Table 2: Summary of Initial Financing Plan
($ million)

Source	Foreign Currency	Local Currency	Total Cost	Share of Total (%)
A. External				
Asian Development Bank	20.9	15.1	36.0	80
Subtotal (A)	**20.9**	**15.1**	**36.0**	**80**
B. Domestic				
National Government	0.0	5.5	5.5	12
Provincial/District Government	0.0	0.5	0.5	1
Communities	0.0	3.0	3.0	7
Subtotal (B)	**0.0**	**9.0**	**9.0**	**20**
Total	**20.9**	**24.1**	**45.0**	**100**

Source: Asian Development Bank estimates.

D. Status and Progress of Project Implementation

9. Due to significant increases in construction costs during the implementation period, the water supply systems in 118 subprojects were prioritized out of the originally planned 240 subprojects. The other subcomponents—such as flood control and drainage facilities, local roads, and urban subprojects—were not undertaken as originally planned; the Government allocated separate funds for these.

10. The Project was scheduled to close in December 2006 but, due to start-up delays of about 2 years, the loan closing date was extended to 31 December 2008. Overall progress of

the Project up until 2005 was slow and, due to lack of performance of the project management unit (PMU) and the consultants, the quality of works in some subprojects needed improvement. The Government rectified the situation by taking drastic action and replaced the entire project team. The new team streamlined the project implementation by working on the rectification of previous subprojects, which is currently ongoing, and also completing the remaining new subprojects. The new team, through the project performance monitoring system, monitors the performance of community drinking water users' unions (CDWUUs) at the subproject level and develops commensurate mitigation plans based on a biannual review addressing inter alia tariff collection, subproject system operations, and sustainability.

11. With regard to developing the capacity of the CDWUUs, the PMU through the four project implementation units (PIUs) at the oblast level, undertook a structured program of social mobilization to ensure that the CDWUUs adequately manage the assets created through the Project. Problems noted on several post-2005 subprojects, such as inadequate training for CDWUUs in preventive maintenance and financial management and lack of coordination with the *ayil okmotus*, (village administrations)[2] were the main institutional challenges when the new PMU team assumed the charge. The social mobilization, CDWUU training on asset maintenance, and the hygiene and sanitation education program, were coordinated by the PMU through two coordinators and two specialists for institutional development and hygiene and sanitation education. At each PIU, five staff members were responsible for CDWUU training and institutional development for long-term service sustainability. Based on the successful outcome, the PMU is now conducting exchange programs between CDWUUs to improve the working knowledge of CDWUU members to provide efficient services. Building on these lessons, the PMU and PIUs will continue developing the capacity of CDWUUs and the local self-government.

12. To ensure the quality of all the subprojects was in line with the communities' requirements, in 2008 ADB conducted an extensive field survey of a large number of completed and ongoing subprojects and provided detailed specific solutions to the Government for rectifying all the identified problems. The action plan of rectification works is detailed in Supplementary Appendix C. The initial Project will be completed by the end of 2008.

13. A detailed review of the completed and ongoing subprojects, and consultations with the beneficiaries, nongovernment organizations (NGOs), various agencies of the Government, and the PMU revealed several lessons. This warrants improvement in the subproject selection and technical design criteria, and overall implementation arrangements. The following are the key lessons learned:

(i) Formation of the community-based organization, and community mobilization with intensive awareness generation on the subproject selection criteria and post-implementation requirements, should be carried out before selection of subprojects and commencement of designs.

(ii) In-kind community contribution of 15% of the subproject cost, where the community had to provide labor to contractors, was found to be unworkable, and this caused considerable implementation delays, conflict with contractors, and eventually poor quality of construction. Therefore, it should be excluded from the subproject selection criteria.

[2] *Ayil okmotu* – a village administration consisting of several (usually from 3 to 8) villages and settlements. The body, under the overall control of National Local Self Government Agency, is responsible for promotion of economic and social development (including water supply and sanitation) on a related territory.

(iii) A cash contribution of 5% of the subproject cost was found generally acceptable by communities, subject to a ceiling to be determined based on the communities' ability to pay. In some cases, due to the high cost of a subproject, this 5% share became unaffordable and eventually communities had to omit some very important components, such as rehabilitation of main pipelines. Such omissions in certain subprojects led to continued leakages from installed pipes, causing water shortages, public unrest, lack of tariff collection, and eventually led to an unsustainable service. Therefore, an affordability analysis is mandatory for elaborate and costly subprojects.

(iv) To ensure successful community-based operations, it is essential that the size of a subproject should be compatible with the community's management capacities. Some subprojects were planned and implemented by including a large number of villages with a total population of more than 30,000, where the geographic spread was over 80 kilometers. Communities in such villages are struggling to properly maintain and operate the system.

(v) None of the communities were provided with maintenance equipment. Therefore, the CDWUUs had to rely on rented equipment, which in many cases was unaffordable. The majority of the communities expressed their willingness to procure such equipment on installments and requested the Project to facilitate the creation of a revolving fund. Under this fund, O&M equipment would be procured for a group of close CDWUUs which could jointly repay the cost in installments.

(vi) Stand-alone water supply subprojects without sanitation caused serious environmental problems and created health hazards. No subproject should be implemented without adequate disposal and treatment of sewage. Simplified, cost-effective waste disposal and treatment techniques should be adopted for rural areas.

(vii) CDWUUs' training in O&M of the infrastructure with user-friendly operation manuals in the local language is essential to ensure sustainable operations by CDWUUs.

(viii) To ensure sustainability of subprojects, involvement of the ayil okmotus from the stage of identification to post-implementation should be made mandatory for back-up support to CDWUUs in (a) facilitating efficient tariff collection, particularly from nonpayers; (b) helping in case of major breakdown of machinery; and (c) resolving social conflict within CDWUU members or the community. Similarly, the role of oblast rural water department officials is important for providing technical guidance to CDWUUs.

(ix) CDWUUs are subject to various taxes usually applicable to commercial entities, which are major risks affecting the financial sustainability of subprojects. To ensure sustainable community-based operations, the tax structure needs to be reviewed so that it reflects that the CDWUUs are performing a public service on behalf of the ayil okmotu and are not commercial enterprises.

(x) Several communities demanded water meters due to misuse of drinking water facilities for irrigation by some individual households, which adds to water expenditure, particularly on pumping. Further, uncontrolled use of water has been shown to cause environmental problems. Several CDWUUs expressed

their willingness to pay for meters if the Project facilitates procurement and recovers the cost through installments.

(xi) Outdated Soviet design criteria must immediately be replaced with the improved guidelines to ensure that simple, technically sound, and cost-effective technologies are adopted.

(xii) Community exchange visits on successful subprojects and dissemination of good lessons of the regional projects should be promoted to motivate project communities to follow good practices.

III. THE PROPOSED SUPPLEMENTARY GRANT

A. Proposed Changes and Impacts on the Project

14. The proposed supplementary grant is required to meet the cost overruns due to significant increases in construction costs during the implementation period, and the change in scope of the Project as set out below:

(i) **Service coverage.** Physical infrastructure financed under the supplementary grant will be limited to meeting the desperately needed water supply and sanitation services for the rural population as prioritized by the Government. The other subcomponents—such as flood control and drainage facilities, local roads, and urban subprojects—will be excluded from the original scope, and for which the Government has allocated separate funds. Based on the improved selection criteria, which excludes unsustainable costly subprojects, it is envisioned that 122 subprojects in about 200 villages with a total population of about 300,000 will be covered by the supplementary grant. Sanitation will be the integral part of each subproject. The World Bank and the Department for International Development of the United Kingdom (DFID) also plan to expand their assistance to the project oblasts for the water supply and sanitation services in uncovered areas following the same selection criteria. For the villages not meeting the selection criteria, the Government will make separate arrangements through its own resources.

(ii) **Subproject selection and technical design criteria.** Based on lessons from ongoing and completed projects, ADB, the World Bank, and DFID have jointly improved the criteria for subproject selection and technical design, which have been approved by the Government. Improvements in subproject selection criteria include: (a) excluding the unworkable in-kind community contribution of 15% of the total subproject cost; (b) ensuring the up-front collection of 5% cash contribution from communities before the award of contract; (c) ensuring the signing of a memorandum of understanding (MOU) by CDWUUs, ayil okmotu, and the Department of Rural Water Supply (DRWS) regarding the agreements on the role and responsibilities of all parties during identification, preparation, implementation, and post-implementation stages of subprojects; (d) ensuring compliance with the resettlement framework for voluntary land donations for community development works; and (e) setting the limits for per capita capital cost of the pump-based and gravity-based subprojects to control selection of high-cost subprojects. The outdated technical design criteria has been replaced

with improved guidelines to ensure that simple, technically sound, and cost-effective technologies are adopted.

(iii) **Implementation arrangements.** Existing implementation arrangements will be modified to improve project implementation, by shifting responsibility from the Ministry of Agriculture, Water Resources and Processing Industry to DRWS, which will serve as the executing agency (EA). In line with the country's legislative and regulatory framework, ayil okmotu's involvement has been made mandatory from the stage of identification to post-implementation to ensure long-term sustainability of the community-based service provisions. With such arrangement, ayil okmotu will continue to provide back-up support to CDWUUs in facilitating efficient tariff collection, disconnecting connections of nonpayers, helping in case of major machinery breakdown, and resolving social conflict within CDWUU members or the community. DRWS will involve its oblast rural water supply professionals for providing technical guidance to CDWUUs. To ensure third-party quality assurance during the project implementation and also provide project management and administration support to the PMU, a team of technical supervision consultants will be appointed. These consultants, in close coordination with CDWUUs, will prepare and disseminate monthly progress reports for transparency and good governance. With the help of consultants, institutional capacities will be developed for DRWS, the ayil okmotus, and CDWUUs. For CDWUUs, particular focus will be in the areas of operation and maintenance of water supply and sanitation systems; financial management including budgeting, accounting, billing and collection, and hygiene and sanitation education.

15. The revised design and monitoring framework is in Appendix 1.

B. Rationale

16. The proposed activities and components under the supplementary grant (i) are consistent with the priorities of the Government and ADB; (ii) comply with the requirements for assessment of impact due to physical changes in the context of current ADB policies; (iii) are technically feasible, economically viable, and financially sustainable; and (iv) comply with the requirements of ADB safeguards policies.

17. The increases in construction costs are attributed to (i) an unexpected surge in the price of steel, cement, pipes, and petroleum products; and (ii) limitations of water sources located close to the villages and communities. An assessment of the summary price indices (an indicator of construction commodity prices) in the country for 2000–2008 indicated a 120% price increase. Further, an assessment of quoted prices of specific commodities such as steel and asbestos cement pipes indicate a 240% variation for 2002–2007. Consequently, the average per capita cost of construction of water supply infrastructure increased from $20 to $80 between the period of the initial project design and contract award. The net effect was that, during the implementation period, the water supply systems in 118 subprojects were prioritized out of the originally planned 240 subprojects. The other subcomponents—such as flood control and drainage facilities, local roads, and urban subprojects—were not undertaken as originally planned, and for which the Government has allocated separate funds. Appendix 2 summarizes the key outcomes of the cost overrun analysis. Climatic changes and droughts limited the use of springs and groundwater sources located close to villages, and thus the networks had to be connected to more distant water sources. Consequently, the overall scale and cost of

subprojects increased dramatically. Despite cash and in-kind contributions solicited from many communities, total funding provided under the Project was inadequate to meet the original targets. Unless additional funding is provided, many communities which had high expectations of benefiting from the Project will remain without safe water supply and sanitation.

18. The World Bank and DFID-assisted project[3] for the remaining three provinces of the Kyrgyz Republic is scheduled for completion by the end of 2008. That project also experienced price escalations and the World Bank and DFID are jointly considering additional financing for meeting the planned benefits and impacts.

19. The proposed supplementary grant will finance the implementation of the remaining 122 subprojects, providing much-needed water supply and sanitation services for about 300,000 people in 200 villages who could not be covered under the Project. The supplementary grant will also cover all the identified rectification works and include the procurement of much-needed O&M tools for sustainable operations.

20. Social analysis and the poverty reduction and social strategy derived for the supplementary grant (Appendix 3) indicate the need for providing water supply and sanitation services to the uncovered population. By financing provision of these services, the supplementary grant will contribute to improvements in health and provide an opportunity to strengthen the role of women in the community. It will also lessen the burden on women as the main collectors of water. Based on lessons from both ADB and World Bank and DFID-assisted projects, the improved subproject selection and technical design criteria will ensure selection of strictly demand-driven subprojects, and use of simple, technically sound, and cost-effective approaches. Through the improved implementation arrangements and a robust consultative and participation plan, the Project will include mandatory steps to ensure community involvement at all stages, including identification, selection, planning, design, and implementation of subprojects. In addition to safe drinking water supply, the Project will (i) focus on rural sanitation, (ii) expand the hygiene education program, and (iii) ensure intensive training of community organizations on sound financial management and O&M practices is undertaken.

C. Safeguards

1. Environmental

21. The Project is expected to have a significant positive impact on the improvement of the environment. Based on the initial environmental examination (IEE) prepared for the initial project, mitigation and monitoring measures are being taken. This IEE including environmental management plan (EMP) will continue to be the basis for the implementation of environmental mitigation and monitoring measures. Since the project scope and design will not change, a new environmental assessment is unnecessary. The environmental assessment and review framework to guide the implementation of subprojects under the supplementary grant is detailed in Appendix 4 and takes into account project experience and lessons learned under the Project. The environmental assessment and review framework also ensures updating the IEEs and the EMPs for the Project, considering modified activities to reflect mitigation measures for subprojects covered under the supplementary grant. To ensure and further improve project environmental management the EA and the PMU will: (i) engage an environmental expert at the

[3] World Bank. 2001. *Project Appraisal Document on a Proposed Credit in the amount of SDR 12 million ($15 million equivalent) to the Kyrgyz Republic for a Rural Water and Sanitation Project.* Washington, DC.

PMU to oversee and approve IEEs prepared by the PIUs (with assistance from the technical design consultant); (ii) develop a groundwater quality testing program to monitor groundwater quality at treated sewage discharge points; and (iii) train the PIUs and contractors in the use of occupational health and safety and environmental monitoring checklists. The EMPs will be included in the civil works contracts.

2. Resettlement

22. Small-scale water supply and sanitation subprojects financed under the supplementary grant will consist primarily of a network of underground pipelines, water intake, storage reservoirs, and wastewater disposal. By their very nature these works will be constructed in the public rights-of-way. However, land will be required in small parcels for the purposes of water source development, overhead reservoirs, water transmission lines, and wastewater disposal works. It is expected that communities or individuals will volunteer their land (such as unutilized community-owned land) for these small facilities that benefit them directly. Therefore, no resettlement will be required, and this was also confirmed during the special loan review mission in May 2008 through a study of 45 selected subprojects. Any voluntary land donation will be carried out in accordance with the resettlement framework for community development works as set out in Appendix 5. In case of any grievance, the Government has agreed that the grievance redress mechanism in the resettlement framework will apply.

3. Indigenous People

23. Subprojects under the Project have not encountered any issues relating to indigenous people. Further research and extensive field visits conducted during the processing of the supplementary grant confirmed that all people living in the project areas are ethnic Kyrgyz, so there are no indigenous people issues.

D. Asian Development Fund IX Grant

24. Based on the debt sustainability analysis and the revised Asian Development Fund (ADF) grants framework,[4] the Kyrgyz Republic is eligible for 100% grant financing and is classified under the high-risk category of debt distress. The ADF IX grant program aims to provide development assistance to help countries tackle development issues in an environment of debt vulnerability, and assist countries to develop the private sector, create employment opportunities, and achieve sustainable economic growth, without increasing external debt burdens. The grant effectiveness will be assessed within the broader context of the project performance. The project design and monitoring framework has clear indicators to measure the inputs, activities, and outputs (Appendix 1).

E. Revised Cost Estimates

25. Revised cost for the Project, including the cost of the initial loan ($36 million), the proposed grant ($30 million), and the total counterpart sharing ($16.5 million), is estimated at $82.5 million including taxes and duties, physical and price contingencies, and financing charges during implementation. Table 3 summarizes the revised cost estimates for the Project, and details of the revised cost estimate are in Appendix 6.

[4] ADB. 2007. *Revising the Framework for Asian Development Fund Grants*. Manila.

Table 3: Summary of Revised Project Cost Estimates
($ million)

Source	Initial Financing	Supplementary Financing	Revised Cost	Share of Total (%)
A. Physical Infrastructure and Equipment [a]				
1. Water Supply and Sanitation	38.90	27.00	65.90	79.88
2. Rectification Works and Equipment	–	4.00	4.00	4.85
Subtotal (A)	**38.90**	**31.00**	69.90	84.73
B. Capacity Development [a]				
1. Capacity Development Program	1.10	1.00	2.10	2.55
2. Hygiene and Sanitation Education Program	0.40	0.50	0.90	1.09
3. Consulting Services	2.70	1.50	4.20	5.09
Subtotal (B)	**4.20**	**3.00**	7.20	8.73
C. Project Management and Administration	**–**	**2.50**	2.50	3.03
D. Contingencies[b] **/Financing Charges**	**1.90**	**1.00**	2.90	3.52
Total	**45.00**	**37.50**	**82.50**	**100.00**

[a] In mid-2008 prices and includes taxes and duties of $4.6 million.

[b] Physical contingencies computed at 5% for civil works, equipment, consulting services and project administration cost. Price contingencies computed at 5% for domestic inflation and 2.5% in all years for foreign exchange fluctuation.

Source: ADB's current applicable policies and the project management unit estimates.

F. Revised Financing Plan

26. The Government has requested ADB to provide a supplementary grant of $30 million from ADB's Special Funds resources to finance the Project's cost overrun and change in scope. The initial loan of $36 million was allocated from ADB's Special Funds resources. With the supplementary grant of $30 million, the total available loan and grant amount will be $66 million. Under the revised financing arrangements, the total ADB funding will cover 80% ($66 million) of the total investment cost of $82.5 million. The proposed supplementary grant will also cover 80% ($30 million) of the additional financing requirement of $37.5 million, which will finance a portion of the civil works, equipment, capacity building, and project management and administration costs. Counterpart funds from the Government will account for 16.4% ($6.15 million) of the additional financing requirement, which will include incremental administration, financing charges, taxes and duties, land, and a portion of civil works, equipment, and consulting services costs. The communities will contribute 3.6% ($1.35 million) of the additional financing towards civil works and equipment, which is 5% of the capital expenditure on water supply and sanitation works of new subprojects, i.e., excluding the rectification works. Table 4 summarizes the revised financing plan for the Project.

Table 4: Summary of Revised Financing Plan
($ million)

Source	Initial Financing	Supplementary Financing	Revised Financing	Share of Total (%)
A. External				
1. Asian Development Bank	36.0	30.0	66.00	80.00
Subtotal (A)	**36.0**	**30.0**	**66.00**	**80.00**
B. Domestic				
1. National Government	5.5	6.15	11.65	14.12
2. Provincial/District Government	0.5	–	0.50	0.61
3. Communities	3.0	1.35	4.35	5.27
Subtotal (B)	**9.0**	**7.50**	**16.50**	**20.00**
Total	**45.0**	**37.50**	**82.50**	**100.00**

Source: Asian Development Bank estimates.

G. Implementation Arrangements

1. Project Management and Administration

27. The project execution under the supplementary grant will be through DRWS with a long-term mandate for water supply and sanitation (WSS) sector development, providing the policy directive and financial support to the sector. The underlying legal, regulatory, and service sustainability frameworks are in Appendix 7. Financial management assessment of DRWS (Supplementary Appendix A) confirmed its capacity to implement and manage the Project. The existing PMU at DRWS will continue to provide overall coordination. The National Agency of Local Self-Government (NALSG) and the PIUs already established at oblast level will jointly implement the Project. The PMU and the PIUs will ensure asset creation and capacity building of the CDWUUs in asset management and strengthening. NALSG will ensure ayil okmotu participation in the project cycle and commitment to meet WSS service delivery obligations. With the help of the PMU, NALSG will elicit ayil okmotu and CDWUU participation through the community awareness and participation program, hygiene and sanitation education program, and asset management and strengthening program. A project coordination committee—comprising representatives from DRWS, NALSG, the Ministry of Finance, the Ministry of Health, and the Ministry of Economic Development and Trade—will meet at 6-monthly intervals (or earlier if needed) to oversee project implementation and provide decision-making support on all aspects of the Project. Appendix 8 provides the project implementation arrangements.

28. The current PMU will continue to manage and administer the Project with structural changes to facilitate efficient project management. A project director will head the PMU and three specialists—one each for technical and engineering, institutional development, and financial management—will support the project director. The PMU will recruit four additional water supply and sanitation specialists, an environment specialist, and a translator and/or interpreter. Four PIUs situated in each of the four oblasts will oversee project implementation in the villages. Supplementary Appendix D provides a schematic representation of the PMU and PIU composition.

2. Revised Implementation Period

29. The revised project completion date is 31 December 2012 and the grant closing date is 30 June 2013. An implementation period of 4 years is estimated due to the scale and wide spread of subprojects in the four oblasts. A revised implementation schedule is included in Appendix 9.

3. Procurement

30. All procurement financed under the supplementary grant will be carried out in accordance with the ADB's *Procurement Guidelines* (2007, as amended from time to time). Contracts for civil works that are estimated to cost more than $1 million equivalent will be issued using international competitive bidding procedures. Contracts for civil works estimated to cost $1 million equivalent or less will be carried out through national competitive bidding procedures acceptable to ADB, and as set out in the procurement plan. To the extent possible, procurement of goods will be grouped into packages larger than $500,000 to be suitable for international competitive bidding procedures. Miscellaneous goods that cannot be grouped into larger contracts, and are estimated to cost less than $500,000 per contract, will be procured through national competitive bidding. Minor items estimated to cost less than $100,000 equivalent per contract may be purchased through shopping. Appendix 10 provides the procurement plan for the Project. Bid documents under the supplementary grant will follow ADB standard bidding documents. The procurement plan will be updated at least annually covering the next 18 months of procurement activity.

4. Consulting Services

31. Sixty eight person-months of international and 1,080 person-months of national (package A) consulting services will be provided for technical supervision consultancy to support the PMU on (i) third-party quality assurance; (ii) innovative technology support; (iii) oversight of subproject construction management and supervision; (iv) information, education, and communication support; and (v) monitoring and evaluation. Consulting services of 840 person-months (package B) will be provided for technical design consultancy to support the PIUs—one team located at Chui for Chui oblast and one team located at Osh for Osh, Jalal-Abad, and Batken oblasts. The technical design consultancy will be responsible for conducting feasibility studies, preparing detailed designs and drawings, and providing bid process management support. The technical design consultancy will be supported by a national consulting firm or NGO (324 person-months) on community mobilization, hygiene and sanitation education, and information, education, and communication addressing the long-term institutional and financial sustainability of the WSS service. All consulting services will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). Package A and B consultants will be hired as a firm based on the quality- and cost-based selection method. International consultants (68 person-months) under package A may be hired as individual or as part of the firm. Provisions for consulting services are summarized in the procurement plan (Appendix 10) and the terms of reference for the three consultancy assignments are detailed in Supplementary Appendix E.

5. Advance Procurement Action

32. ADB has approved the use of advance action to recruit consultants. The advance action will entail issuance of expressions of interest and request for proposals. The advance action is necessary to sustain the ongoing Project and continue with its smooth implementation. The Government has been advised that ADB's approval of advance procurement action does not constitute a commitment to finance the Project.

6. Subproject Selection

33. Each subproject will be selected in accordance with the criteria agreed with the Government (Appendix 11): (i) the subproject is primarily located in an area where there is an acute shortage of water or the existing system of water supply and sanitation is dilapidated and requires major rehabilitation or replacement; (ii) the community does not currently have an organized water supply system; (iii) the beneficiary community is willing to form a CDWUU to undertake O&M of the subproject and to share its capital cost and a scheme-specific tariff to defray the O&M costs; (iv) the subproject complies with ADB safeguard policies and has no significant environmental impacts; (v) the subproject will not involve any involuntary resettlement—for any small parcel of land donated by any community individual for purposes of water source development, overhead reservoir, water transmission line, and wastewater disposal works—if there is no livelihood from or occupation of the land or if the land is barren, and it has no impact on the livelihood of any individual; (vi) the PMU will prepare an IEE and, as required, an environmental impact assessment; and (vii) the CDWUU will sign two agreements substantially in line with the samples agreed upon between DRWS and ADB (Appendix 12 and 5). The first agreement relates to the community's commitment to take over the subproject with full responsibility for O&M; the second agreement refers to voluntary transfer of ownership of small parcels of land for the subproject. Implementation of any subproject estimated to cost more than $300,000 will require ADB's approval, to ensure the use of simple and cost-effective techniques. Other subprojects will require DRWS approval, but ADB will also review these subprojects selectively to ensure compliance with the selection criteria.

7. Disbursement

34. The Project will continue to disburse funds based on the existing ADB procedures in accordance with the *Loan Disbursement Handbook (*2007, as amended from time to time). A new imprest account will be established at a bank to be agreed upon by the Government and ADB to facilitate the timely release of grant funds. The Ministry of Finance will supervise the imprest account operations. The individual payments that may be reimbursed or liquidated under the statement of expenditure procedure will not exceed $50,000 equivalent.

8. Project Review, Accounts, and Audits

35. The PMU and PIU will continue to maintain separate records and accounts adequate to identify financing resources received and expenditure made on the Project, including expenditure for works, equipment, and services financed out of the grant proceeds and local funds. The grant accounts and related financial statements will be audited annually in accordance with sound auditing standards by auditors acceptable to ADB. The EA will submit annual audited reports, including separate audit opinion on the use of the imprest account and

the statement of expenditure procedures, and audited financial statements to ADB within 6 months after the end of each fiscal year.

9. Governance and Anticorruption

36. ADB's *Anticorruption Policy* (1998, as amended to date) was explained to and discussed with the Government. Consistent with its commitment to good governance, accountability, and transparency, ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the Project. To support these efforts, relevant provisions of ADB's *Anticorruption Policy* are included in the grant regulations and the bidding documents for the Project. In particular, all contracts financed by ADB in connection with the Project shall include provisions specifying the right of ADB to audit and examine the records and accounts of the EA, implementing agency, PMU, PIU, and all contractors, suppliers, consultants, and other service providers as they relate to the Project.

37. Under the Project, there have been allegations of possible fraud by contractors in 10 subprojects. These are being currently investigated by ADB. In the meantime, the Government has agreed to take the following measures to strengthen financial controls and prevent misuse of funds. It will

(i) oversee financial management of the Project based on the approved *Guidelines on Administrative and Finance Management of the PMU* through the DRWS order no. 9 of 22 February 2007;

(ii) institute a system of controls to ensure that all cash and banking transactions undergo four levels of checks—accountant, financial manager, director of the PMU, and director general of DRWS;

(iii) submit monthly and quarterly financial reports to the Ministry of Finance and ADB to confirm compliance with accounting standards and fund utilization;

(iv) submit all withdrawal applications for replenishment to the Ministry of Finance and ADB with detailed information on current expenditures for the related period with supporting documents confirmed by the director of the PMU after verification by the financial manager and PMU consultants;

(v) manage and tally financial data periodically on the Software-1C system at the PMU;

(vi) have the project accounts audited annually by the chamber of accounts and by an independent auditing firm, and promptly comply with the audit recommendations;

(vii) ensure that the technical supervision consultant (a) provides third-party quality assurance on construction practices and appropriate equipment and material usage by contractors, and (b) applies adequate quality assurance and control measures during project implementation; and

(viii) ensure that the PMU staff and project consultants (a) undergo training on ADB's *Anticorruption Policy*, (b) understand how and where fraud and corruption may occur, and (c) learn possible measures to reduce such occurrences.

IV. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Benefits and Impacts

38. The supplementary grant is expected to benefit about 200 villages with an overall population of about 300,000 people. It will improve living standards, the environment, and public health. Related benefits include time and cost savings from purchasing, fetching, treating, and storing water; improved hygiene and health; reduced medical outlays; and increased productive days. The grant will also support improvements in operational efficiency of the community-based organizations.

B. Economic and Financial Analysis

39. The analysis of the three core samples have been updated in consideration of the substantial price hikes that were unforeseen during the initial project preparation stage. For the financial analysis, the weighted average cost of capital (WACC) was estimated at 3% and the financial internal rate of return (FIRR) in the base case ranged between 7.5% and 9.4%. The economic analysis indicates that the subprojects are economically viable with the economic internal rate of return (EIRR) exceeding the economic opportunity cost of capital (EOCC) in all cases. The EOCC was assumed at 12% and the EIRRs in the base case range between 23.4% and 28.8%. The resulting benefit–cost ratios for the subproject range between 1.35 and 1.5, also denoting feasibility. Sensitivity analysis conducted to test the robustness of the financial sustainability and economic viability of subprojects when subject to change (a 20% increase in capital cost, a 20% increase in O&M cost, a 20% reduction in benefits, and a 1-year delay in benefits) indicate that in all cases subproject FIRRs surpass the WACC and EIRRs surpass the EOCC. Details of the financial and economic analysis are in Appendixes 13 and 14, and in Supplementary Appendix B.

40. Reassessment of the financial sustainability and economic viability suggests that the integrated benefits and impacts are expected to outweigh the increased costs. For higher financial and economic returns, the planned coverage needs to be achieved and a smooth transition undertaken from completion of works to operations. Analysis findings indicate that the sample subprojects are financially viable on two measures: (i) required periodic tariff increases (herewith assumed every 2 years), and (ii) tariff subsidization based on cost recovery with regard to consumer affordability. For these measures to be relevant to the succeeding subprojects under the supplementary financial assistance, they would be incorporated when preparing subproject financial operational plans. These plans and related issues have been discussed and agreed with DRWS for achieving financial sustainability of the overall investment. Issues pertaining to subsidization, the manner of implementation, and funds sourcing, are specifically relevant. Affordability is a major factor in determining subsidy requirement, and thus household income bases may need to be reviewed periodically. There is an ongoing effort by the CDWUUs and the PMU for improved tariff collection. This includes improvements in service delivery, introducing consumer services to register complaints and urgently rectify the situation, and the proposed involvement of the ayil okmotu for helping the CDWUUs in bill collection and disconnecting the services of nonpayers. The ayil okmotu also have funds in case of revenue shortfall for addressing major breakdowns in the water supply system, which are beyond the financial capacity of the CDWUUs.

C. Risks

41. Four possible project risks have been identified: (i) turnover of existing staff of the PMU can adversely affect the quality and efficiency of work and thus delay project implementation; (ii) poor selection of contractors at any time during the implementation could hamper the project quality and community members might consequently withdraw from their commitment to take over the O&M of the subprojects; (iii) selected sources of water supply might turn out to be unsustainable; and (iv) the Project may become unsustainable if tariffs are not periodically increased. The Project includes the following measures to mitigate these risks.

42. The Government shall endeavor that no staff transfers take place during the project implementation period and the capacity of the PMU and/or PIUs will be further strengthened as per agreed staffing strength. To ensure the selection of qualified contractors, the performance of existing contractors will be reevaluated to qualify only those contractors who have performed well during the initial project implementation. Further, a more stringent criterion will be applied for the prequalification of new contractors. For the selection of sustainable water sources, improved guidelines for undertaking comprehensive investigations have been agreed that will ensure the desired water yield from the selected water supply sources. Involvement of communities in the identification and selection of sources and the overall implementation will ensure their ownership and minimize the risk of subprojects being unsustainable. The Government has also assured that the ayil okmotu, as mandated by law,[5] will ensure CDWUUs revise tariffs periodically to meet O&M costs of subproject. Where required, the ayil okmotu will provide financial support to CDWUUs and ensure that service is efficiently delivered and the system does not experience breakdown.

V. ASSURANCES

43. The Government has given the following assurances, which are incorporated in the legal documents:

(i) DRWS will make all possible efforts to retain the PMU of the ongoing Project and its key staff for the Project. DRWS will strengthen PMU and PIU staff capacity for identifying subprojects, mobilizing the community, and forming and developing CDWUUs.

(ii) DRWS will ensure that each proposed subproject meets the subproject selection criteria before the proposal is approved under the Project.

(iii) The Government will ensure that adequate annual budgetary allocations are made and the counterpart funds made available to DRWS and the PMU in a timely manner.

(iv) Within 3 months of ADB's approval of the supplementary grant, the Government will cause DRWS and the participating departments to ensure that a project coordination committee is established.

(v) The Government will ensure that any voluntary donation of land made for community development works (such as water source development, overhead

[5] The Kyrgyz Republic Law on Local Self-Government lays the responsibility for water and sanitation service delivery on the third tier of the Government, ayil okmotu.

reservoir, water transmission line, and wastewater disposal works) is undertaken in compliance with ADB's *Involuntary Resettlement Policy* (1995), applicable local laws, and in accordance with the terms of the agreed resettlement framework, and that it obtains suitable consent letters from all affected people under the initial and the proposed project for voluntary donation of their lands.

(vi) The Government will ensure, and cause DRWS to ensure, that (a) the subprojects are designed and implemented, and the subproject facilities operated and maintained, in strict conformity with the laws and regulations of the Government and ADB's *Environment Policy* (2002); (b) IEEs (or environmental impact assessments, if necessary) are undertaken for each subproject in accordance with the environmental assessment and review framework; (c) IEEs and EMPs are submitted to ADB for prior approval for any subproject costing $300,000 or more; (d) any adverse environmental impacts are minimized by implementing the mitigation measures and the monitoring program set out in the EMPs; (e) implementation of the EMPs and any violation of the environmental standards are reported to ADB semiannually; (f) necessary government permits are obtained prior to commencement of civil works; (g) EMPs are incorporated in the bidding documents and made a part of the civil works contracts; (h) the implementation of the EMP by the contractors is closely monitored; and (i) annual reports are submitted to ADB on the implementation of EMPs.

(vii) DRWS will continue to monitor the water quality of all the completed project schemes and the subprojects at 6-monthly intervals, particularly after the monsoon season, and undertake timely measures to address any case of contamination.

(viii) DRWS will establish suitable mechanisms under the Project to finance the procurement of O&M equipment and water meters for the interested CDWUUs.

(ix) The Government will make all possible efforts that no staff transfers of the PMU and PIUs take place during the project implementation period.

(x) To ensure the selection of qualified contractors, DRWS will cause the PMU to reevaluate the performance of existing contractors and qualify only those contractors who have performed well during the initial project implementation. The PMU will also ensure that a more stringent criterion is applied for the prequalification of new contractors.

(xi) DRWS will cause the PMU to ensure that comprehensive investigations are undertaken for the selection of sustainable water sources. The PMU will also involve communities in the identification and selection of sources and the overall implementation of the subprojects.

(xii) The Government will ensure that the ayil okmotus (a) conduct annual review of the level and structure of the water tariffs and furnish the results to ADB within 1 month of completion of the review; (b) revise the water tariffs as necessary to ensure that the revenues from water tariffs cover at least the operations and maintenance costs; and (c) provide financial support, where necessary, to CDWUUs and ensure that service is efficiently delivered and the system does not experience breakdown.

VI. RECOMMENDATION

44. I am satisfied that the proposed supplementary grant would comply with the Articles of Agreement of the Asian Development Bank (ADB), and acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve:

(i) the major change in scope, as described in paragraph 14 ; and

(ii) the supplementary grant not exceeding $30,000,000 to the Kyrgyz Republic from ADB's Special Funds resources for the Community-Based Infrastructure Services Sector Project, on terms and conditions that are substantially in accordance with those set forth in the draft Grant Agreement presented to the Board.

Lawrence Greenwood, Jr.
Vice-President

08 October 2008

REVISED DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact Improved public health and environment in project villages	**By 2012:** Public satisfaction with the availability, quality, and quantity of water is increased (to be quantified when baseline is established through a social survey at project inception) Increased population coverage in project villages with access to safe and adequate water supply from existing 32% to 100% Reduced incidence of waterborne diseases from 30% to 5%	Annual socioeconomic surveys undertaken as part of a performance management system National statistics for water systems ADB project performance audit report	**Assumptions** • The improved water supply systems are effective and will be sustained after intensive training • The project communities remain committed to participating in all activities with the help of the National Agency for Local Self-Government **Risk** • The communities do not properly maintain the infrastructure
Outcome Safe, adequate, and efficient water supply and sanitation services	**By 2012:** In 200 villages environmental degradation is controlled and natural resources are appropriately tapped to meet community demand Water supply and sanitation assets are strengthened and community is fully involved in operating and maintaining the subprojects Service delivery is improved through adequate supply and quality of water	Department of Rural Water Supply's annual report on coverage of water supply and sewerage ADB project completion report and project performance evaluation report	**Assumptions** • Water supply systems are rehabilitated and new systems developed as scheduled • Communities are involved in subproject planning and design, and trained in asset management • Communities collect tariff efficiently and set aside funds for major breakdowns **Risks** • High turnover of existing staff of the PMU affects project implementation • Lack of community involvement in project cycle
Outputs 1. Rehabilitated and newly constructed water supply and sanitation systems in project villages	**By 2012:** Continuous and potable water supplied at pressures according to approved design standards to communities residing in 200 villages of the four *oblasts* (provinces) Sewage is disposed of and treated in all project villages through simplified technology Communities provided with tools and equipment for system maintenance	Quarterly progress reports, ADB review mission reports, and ADB project completion report DRWS technical and financial reports Socioeconomic surveys	**Assumptions** • Communities participate in subproject planning and design • Water resources remain protected and reliable • All communities are willing to pay for improved water supply and sanitation services and systems are financially sustainable
2. Communities are managing water	Project undertakes institutional strengthening and capacity		**Risks**

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
supply systems and collecting tariffs to address cost recovery	enhancement of communities, through appropriate IEC campaigns Communities undertake preventive maintenance of systems Communities achieve 80% tariff collection efficiency		• Poor selection of contractors • Communities do not maintain the filters and water treatment facilities • Selected sources of water supply prove to be unsustainable • Lack of training provided to communities for technical and financial management
3. Government issues a sector development policy and legal and regulatory framework for rural water asset creation and service delivery	Government ratifies a sector policy addressing community-based water supply and sanitation services, asset management, and principles of cost recovery Government enacts a law detailing the responsibilities and charter of community drinking water users' unions Government enacts a law on local self-governments and responsibilities for drinking water supply and sanitation to rural communities		
Activities with Milestones 1. Rehabilitated and newly constructed water supply and sanitation systems 1.1 Consultants appointed by March 2009 1.2 Award of civil works to commence by June 2009 1.3 Completion of all civil works by December 2012 2. Communities managing water supply and sanitation systems and collecting tariffs to ensure cost recovery 2.1 Information, education, and communication campaign on community and stakeholder participation commenced by March 2009 and continued through the project period 2.2 Project coordination committee and adequate oversight mechanisms in place by April 2009 2.3 Tariff collection performance for completed systems to progressively reach 90% through the project period based on subproject completion 2.4 Voluntary land donations appropriately monitored 3. Government issues a sector development policy, and legal and regulatory framework for rural water and sanitation asset creation and service delivery 3.1 Government ratifies a rural water supply and sanitation sector policy by June 2009 3.2 Government enacts a law on CDWUU charter and responsibilities by June 2009 3.3 Government enacts a law on local self-governments' responsibilities for drinking water supply and sanitation services by December 2009			**Inputs** Project cost: $37.5 million ADB total: $30 million Government and communities: $7.5 million

ADB = Asian Development Bank, CDWUU = community drinking water users' union, DRWS = Department of Rural Water Supply, PMU = project management unit, IEC = information, education and communication.

COST OVERRUN ANALYSIS

A. Background

1. This appendix substantiates the escalation in construction contract costs and the consequent affect on the project scope of work, which was limited to implementing water supply systems in villages alone. The price escalations in construction material over the project period have affected the overall impact of the Project.[1]

2. The civil works and equipment component of the Project constituted 71.5% of the total project cost. Civil works comprised supply and laying of pipes (steel, asbestos cement, and polyethylene pipes), valves and appurtenances, fuel for operation of heavy machinery and freight, steel, and cement concrete for construction of storage reservoirs. Equipment comprised pumping machinery for deep boreholes and for discharging water to households in elevated areas of the villages. The cost overrun analysis was carried out on (i) construction material price variation, and (ii) price indices for construction commodities over the project period from 2002 to the end of the second quarter of 2008.

B. Price Variation Analysis

3. **Construction Material Price Variation.** Supply and laying of pipes (steel and asbestos cement) were the major constituents in the construction contracts awarded during the initial project period. Evaluation of quoted prices for seven contracts on the above items between 2002 and 2007 indicates a 238% rise in unit rates of supply and laying of steel pipes (220 millimeters [mm] diameter) and asbestos cement pipes (150 mm diameter). On average, the aforesaid items constitute 10%–50% of the total contract value, based on the subproject design. Table A2 provides details of variation in construction material unit price drawn from contracts awarded during the period.

4. **Construction Commodity Price Index.** The summary price index (SPI, or the construction price coefficient) for construction commodities generated by Gosstroi (the State Committee for Architecture and Construction of the Kyrgyz Republic) is an indicator of the market rates of construction materials. The SPI is derived based on the price index adopted by producers of construction materials (for civil works), for vehicles and equipment used in construction, and other capital expenditure, and is weighted by the share of the abovementioned elements in the total volume of investment in the base cost of the works.

[1] ADB, 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project*. Manila.

Table A2: Construction Material Unit Price Variation

Item	Unit	2002	2003	2004	2005	2006	2007
Subproject		Sary-Kolot	Tash-Bashat	Baityk	Kulundu	Vozneseno vka	Sary-Kolot-Kydyrsha
Rayon		Kara-Suisk	Yssyk-Atynsky	Alamedinsky	Lyailyaksy	Panfilovsky	Kara-Suisky
Contract No.		ADB-1742-OS-001	ADB-1742-CH-RW-013	ADB-1742-CH-RW-026	ADB-1742-BA-RW-029	ADB-1742-CH-RW-025	ADB-1742-OS-RW-001/2
Supply and laying asbestos cement pipes (Diameter = 150 mm)	meter	120	189	200	450	377	405
Excavation of III–IV group soil by excavator with bucket capacity 0.5 m^3	m^3	10	20	20	18	30	40
Supply and mounting spare parts	item	2,884	2,500	3,000	3,500	3,200	3,500
Supply and laying steel pipes (Diameter = 219 mm)	meter	295	540	-	1,100	1,260	1,000
Supply and mounting cast iron valves (Diameter = 100 mm)	item	1,073	1,200	1,700	2,000	1,880	1,800
Supply and mounting cast iron valves (Diameter = 150 mm)	item	1,746	1,405	1,800	2,500	2,920	2,200

Source: Project management unit estimates.

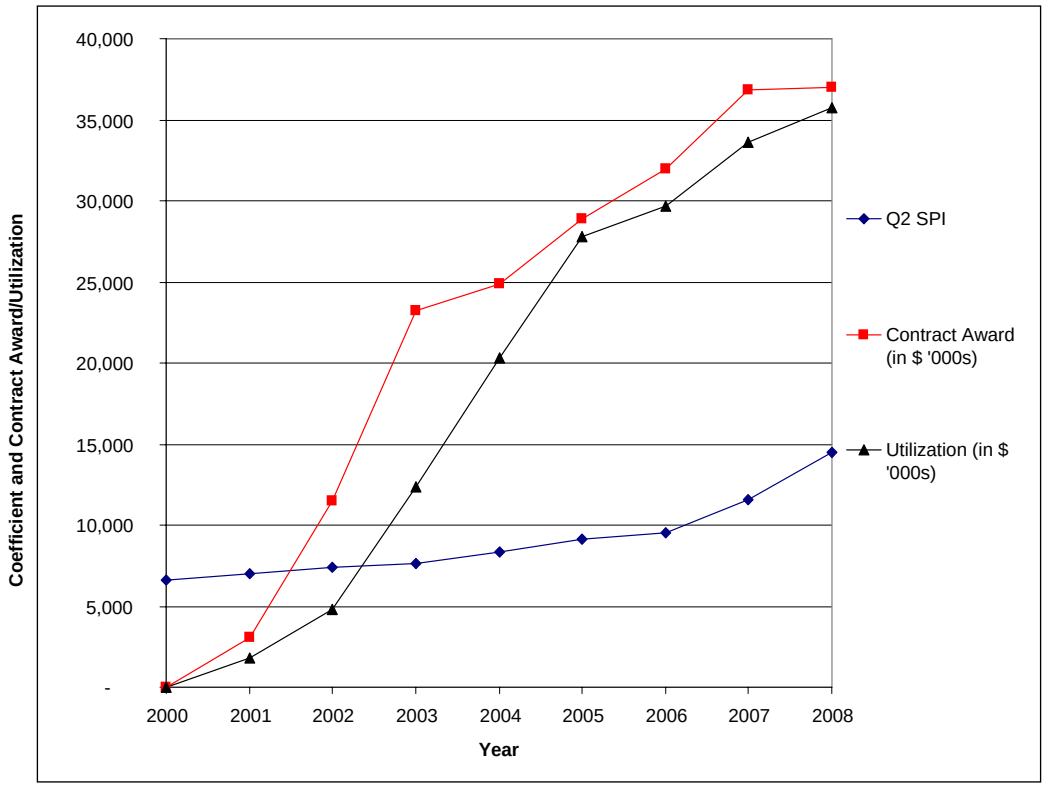
5. The SPI is used by contractors to quote construction commodity prices and is a benchmark used to determine the value of construction contracts in the country. It is based on the Soviet system of determining prices based on a baseline cost in 1991; the Gosstroi then adjusts the prices for the Kyrgyz Republic context. Figure A2 indicates the variation in construction price coefficients (or SPI) over the initial project period along with the status of cumulative contract awards and utilization.

(i) Price index for construction materials (civil works) is computed on the basis of commodity prices, the cost of spare parts, and the cost of structures procured by major contracting organizations throughout the Kyrgyz Republic. It also factors in various technologies adopted by construction organizations based on the topography and territorial peculiarities experienced throughout the country during construction.

(ii) The price index for vehicles and equipment used in construction is computed on the basis of price changes indicated by equipment manufacturers, the cost of transport, supply and sales expenses, and value-added tax.

(iii) The price index for capital expenditure is computed based on costs of design and survey works, operational and deep-hole survey drilling works, and other expenses.

Figure A2: Construction Price Coefficient and Contract Awards/Utilization



SPI = summary price index.
Source: Project management unit estimates

C. Conclusion

6. An assessment of the SPI or construction price coefficient for the second quarters in 2000 and 2008 indicates a 120% rise in the SPI. Reviewing the SPI rise in light of a 238% rise in pipe material cost, it is evident that the Project could not cover the proposed population. Further, the executing agency was forced to limit the subcomponent to water supply alone instead of the originally planned subcomponents of water, sanitation, and the roads sector in both villages and urban centers.

7. Factoring for unanticipated rises in construction commodity prices, the supplementary grant will cover approximately 300,000 persons with water and sanitation infrastructure to meet the project objectives. The Project will therefore cover 75% of the originally designed population coverage on completion in 2012.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country/Project Title: Kyrgyz Republic: Community-Based Infrastructure Services Sector Project			
Lending/Financing Modality:	Sector	**Department/ Division**	Central and West Asia Department Social Sectors Division

I. POVERTY ANALYSIS AND STRATEGY

A. Linkages to the National Poverty Reduction Strategy and Country Partnership Strategy

The Joint Country Support Strategy (2007–2010)[a] for the Kyrgyz Republic supports the Government's country development strategy 2007–2010 (approved in May 2007), which focuses on four strategic pillars—economic development, governance and transparency in public administration, human development, and environmental sustainability—and builds on the strategy laid out in the national poverty reduction strategy 2003–2005.

The joint country support strategy will focus programs on (i) improving economic management consistent with strong and sustained pro-poor growth, reducing corruption, improving governance, and ensuring effective public administration; (ii) building sustainable human and social capital through improved health and education outcomes; and (iii) ensuring environmental sustainability and natural resource management.

The Project is consistent with the joint country support strategy, the Government's country development strategy 2007–2010, and the national poverty reduction strategy. The supplementary grant to the Project will focus on addressing water supply and sanitation services in 200 villages covering approximately 300,000 beneficiaries. Direct benefits will be providing the community access to safe drinking water and improved sanitary conditions through safe disposal of night soil. Further, treated wastewater disposal will ensure that contamination of surface and groundwater sources is prevented.

The facilities built under the supplementary grant will reduce the burden on women, who are the main collectors of water. Improvements in the quality of water and disposal of treated wastewater will lead to public health improvements and consequent reductions in the burden of diseases, treatment costs, and productive losses, the impact of which is felt by the poor in particular. Women, especially poor women, will benefit from the reduction in the time and energy spent in fetching and storing water, and in the work associated with cleaning and family health care.

B. Poverty Analysis

Targeting Classification: General Intervention

Poverty remains high in the Kyrgyz Republic, although extreme poverty is moderate. According to official government data for 2005, on the basis of consumption per capita, an estimated 43% of the population lived below the poverty line and 11% were in extreme poverty. The national poverty line is determined on the basis of the food and nonfood consumption pattern of the lower income group of the Kyrgyz population, and not on international poverty lines. The unit of observation for poverty statistics is the individual. Almost three quarters of poor and extremely poor people live in rural areas due not only to the higher proportion of the population living in this sector but also to the higher prevalence of poverty: 51% of the rural population lived in poverty compared with 30% of the urban population. The incidence of poverty is over 50% in five out of the eight *oblasts* (provinces)—Batken, Naryn, Osh, Jalal-Abad, and Issyk-Kul—in both the northern and southern parts of the country. Poverty and low incomes are prevalent in those areas where geography (i.e., mountains), poor infrastructure, and cross-border issues constrain access to markets. A large number of the poor live in rural Osh and Jalal-Abad, which are the most populous oblasts and fall within the Project's jurisdiction.

Economic growth has resulted in falling poverty over the last half-decade. In 2000, according to official Government estimates, poverty affected 63% of the population and over the next 5 years fell by a remarkable 20 percentage points; however, that finding may in part be a reflection of a change in surveys. Even over the last 3 years, for which comparable data are available, poverty responded strongly to economic growth: for every 1% increase in gross domestic product per capita during 2003–2005, extreme poverty fell by 5% and overall poverty fell by 2%. The reduction in poverty has also been assisted by the decline in the real prices of utilities, which continue to be heavily subsidized and are far below their cost-recovery levels. Much of the decline in poverty stems primarily from the fall in extreme poverty, especially in rural areas. Moderate poverty (the difference between overall poverty and extreme poverty) declined marginally from 33% to 32% and largely due to a decrease in urban moderate poverty rates.

Since human development indicators are closely correlated with income, economic recovery is highly relevant to the achievement of the Millennium Development Goals, which the Project directly addresses by reducing the proportion of people without sustainable access to safe drinking water and basic sanitation.

[a]ADB, Swiss Cooperation, United Kingdom Department for International Development, United Nations Agencies, and World Bank Group. 2007. *Joint Country Support Strategy (2007–2010): Kyrgyz Republic*. Manila.

II. SOCIAL ANALYSIS AND STRATEGY

A. Findings of Social Analysis

Income and Living Standards. The survey conducted suggests that poverty in the southern urban areas is far more widespread than in the northern urban areas. In the surveyed towns, over 38% would appear to be living in extreme poverty, while over 70% are living in poverty. The figures for the southern towns may be exaggerated by the use of the national poverty level, as food prices in particular are considerably lower. In the rural areas, for all the villages surveyed, 52% of expenditure was on food, 12% on utilities, and 13% on education. While the villages chosen for the survey all suffer from substantially nonfunctioning or no water supply systems, there would appear to be a close connection between this fact and the prevalence of poverty. The figures do suggest, however, that care will need to be taken to allow some cross-subsidy within the individual systems, from those who are better off and may request individual connections and those who will collect their water from public standpipes.

Water Supply. In the villages surveyed, only 32% of households had access to a piped water supply system. Thirty-three percent use the river and a further 9% irrigation channels; 15% had water delivered by truck and the remainder used private wells or other sources. Twenty-seven percent of all households had to travel more than a kilometer to the source, while less than half were within 200 meters of their main source of water. About 57% thought their water tasted, looked, and smelled good, while around 15% thought they had bad water, and the remainder were ambivalent. Sixty percent complained that their main source of water was not available all year, with the main reasons given being the poor state of the equipment and freezing of the source.

Sanitation. In all the villages surveyed, almost all households use simple pits, which, once full, are covered and a new one is dug. The most frequent form of wastewater disposal is to throw it in the yard or into an open pit in the garden. Only 2% have septic tanks. The majority (about two-thirds) bathe at home, while 32% use public or private bathhouses. When asked where they would prefer to bathe, 68% mentioned public bathhouses. However, in many places the bathhouse no longer works, either because it has broken down or because of the lack of water.

Perceived Needs for Services. Water was perceived as the highest priority for all the villages surveyed; it was mentioned by over 95% of all households. Sanitation was not recognized as a priority by many people. Less than 7% sought improved individual toilets, and 13% wanted improved school toilets. Bathhouses were, however, a perceived need for about 60% of all households surveyed.

Willingness to Pay. Twenty-three percent expressed a willingness to pay in advance for the development or improvement of the water supply system. All those who wanted to improve their wastewater disposal system (about 25%) said they were willing to pay; of these, approximately 84% mentioned an initial cost contribution of about Som200 per capita. The willingness-to-pay analysis in the core communities shows that about 60% of the households have monthly incomes of less than Som1,000 and the average household consists of five to six family members. The surveyed households stated that water supply in their community was insufficient and a 45% increase of the existing supply is needed. Fifty-one percent expressed their willingness to have their own house connection. They are willing to pay an average Som1,000 for a connection and to spend an average of Som30–Som50 (or Som5–Som10 per person) for monthly water bills; on average, this represents the actual average expected connection fee and monthly water bills of the subprojects.

Social Impact. The supplementary grant will contribute to improvements in health and will provide an opportunity to strengthen the role of women in the community and thereby raise their status. It will also lessen the burden on women as the main collectors of water and the nursing of the sick affected by unsanitary conditions. Time will be saved and improved health should result in improvements in greater productive capacity of the whole population. The subprojects will provide employment opportunities for residents, both in the construction or repair of water supply and sanitation systems, as well as in the management of the systems. All the community drinking water users' unions (CDWUUs) will require some accounting services and there is a strong tradition for women to enter this profession. It is expected that women, by being involved in the CDWUU boards, will be empowered, and that this will result in further initiatives being developed by them.

B. Consultation and Participation

1. Provide a summary of the consultation and participation process during the project preparation.

Extensive consultations have been undertaken with stakeholders including beneficiary communities, nongovernment organizations and community-based organizations, elected representatives (such as village councils), administrative departments, oblast and *rayon* (district) administrations, and representatives of various central Government ministries. Consultation workshops, meetings, focus group discussions, and structured interviews were undertaken with stakeholders.

2. What level of consultation and participation (C&P) is envisaged during the project implementation and monitoring?

☐ Information sharing ☐ Consultation ☒ Collaborative decision making ☒ Empowerment

3. Was a C&P plan prepared? ☒ Yes ☐ No

If a C&P plan was prepared, describe key features and resources provided to implement the plan (including budget, consultant input, etc.). If no, explain why.

Extensive information dissemination and consultations have been undertaken to ensure stakeholder participation in the project design. During the supplementary grant design, it was noted that a key factor in the nonperformance of many subprojects in the initial Project was lack of participation from the community in general and the poor in particular. The consultation and participation plan comprises three distinct components: (i) the community awareness and participation program, (ii) the hygiene and sanitation education program, and (iii) the asset management and strengthening program.

A major feature of the training and capacity-development subcomponent of the Project is enabling the local self-governments (*ayil okmotus*) to take a more participatory approach to water supply and sanitation development and service delivery. Along with the CDWUU, the ayil okmotu will play a key role in detailed planning, design, and implementation of the Project. Implementation support includes the provision of social and community development experts within the PMU and the PIUs, and the conduct of community awareness programs by nongovernment organizations.

Ongoing consultation and participatory monitoring will help ensure that the Project meets the needs of the community. The consultations may take the form of annual surveys, combined with community forums or focus group discussions. The media for this public information mechanism will include local television, newsletters, and community meetings.

C. Gender and Development

Key Issues.

Primary and secondary information was analyzed to assess the status of women in the project villages. There are significant differences in the status of women in the project villages, especially between those villages in the north and south. Women are most frequently the household member most affected by the lack of adequate, clean, and safe water. In the surveyed villages, women were the most frequent primary collectors of water (40%). However, in over a fifth of all households it was the adult males; children collected water in 15% of cases. Overall, adult women were the main collectors of water when there was no individual connection (in 45%). In the south, in 50% of the cases it was the women and only 9% cases the men, while in the northern town, men and women shared this task equally, also relying less on the help of children.

These figures suggest a clear need to ensure women are involved in the design of water supply systems and in the management of the system. In most villages, women are severely underrepresented on the village councils. From the reports of the social organizations of the core subproject villages, women expressed a clear desire to play a central role in the planning and management of water systems.

Key Actions.

Measures included in the design to promote gender equality and women's empowerment—access to and use of relevant services, resources, assets, or opportunities and participation in decision-making process:

☐ Gender plan ☒ Other actions/measures ☐ No action/measure

The Project responds to the key issues above in the design of its subprojects.

III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS

Issue	Significant/Limited/ No Impact	Strategy to Address Issue	Plan or Other Measures Included in Design
Involuntary Resettlement	No impacts. Only voluntary land donations envisaged under the Project.	Subprojects with involuntary resettlement will be screened out and voluntary land donations will be confirmed through a consent letter from the affected person.	☐ Full Plan ☐ Short Plans ☒ Resettlement Framework ☐ No Action

Indigenous Peoples	No impact.		☐ Plan ☐ Other Action ☐ Indigenous Peoples Framework ☒ No Action
Labor ☒Employment opportunities ☐ Labor retrenchment ☒ Core labor standards	No job loss will occur. The construction and operation of the subprojects may generate employment opportunities for local people.	Core labor standards are reflected in contract documents.	☐ Plan ☒ Other Action ☐ No Action
Affordability	The potential negative impact of water tariff increases on the poor is considered to be acceptable, and given that the poor currently pay a higher than average proportion of their incomes on water.	A consumption-based tariff will entail a higher charge on high-consuming (and possibly also higher-income) households.	☒ Action ☐ No Action
Other Risks and/or Vulnerabilities ☐HIV/AIDS ☐Human trafficking ☐Others(conflict, political instability, etc), please specify	No other risks or vulnerabilities have been identified.		☐ Plan ☐ Other Action ☒ No Action

IV. MONITORING AND EVALUATION

Are social indicators included in the design and monitoring framework to facilitate monitoring of social development activities and/or social impacts during project implementation? ☒ Yes ☐ No

ENVIRONMENTAL ASSESSMENT AND REVIEW FRAMEWORK

A. Introduction

1. Environmental assessment must be conducted for subprojects in compliance with the Kyrgyz Republic Law on Ecological Expertise under the competence of the Ministry of Environmental Protection, the Kyrgyz Republic Law on Drinking Water, the Kyrgyz Republic Water Code, and the Asian Development Bank (ADB) *Environmental Assessment Guidelines 2003.* This environmental assessment and review framework document details the environmental impacts and recommended mitigation and management measures, the subproject selection criteria, requirements for consultants, and disclosure, monitoring, reporting, and institutional arrangements for preparing, reviewing, and clearing subproject environmental assessment reports, staffing, and budget.

2. The Community-Based Infrastructure Services Sector Project (comprising water supply and sanitation services) is classified under ADB guidelines as a category B project. For this Project, selection criteria for future subprojects mandates that only category B or C projects, which have no water or wastewater treatment components, will be considered for funding. The Kyrgyz Republic Law on Ecological Expertise requires infrastructure upgrading projects to be subjected to environmental assessment. Under the ADB *Environment Policy* (2002), the first stage in developing an environmental assessment is an initial environmental examination (IEE) and if the IEE concludes that a more comprehensive environmental impact assessment is not required, then the IEE, incorporating an environmental management plan, becomes the final environmental assessment document. The IEE will be prepared taking into account ADB's *Environmental Assessment Guidelines*.

B. Environmental Description

3. All subproject sites are rural villages and small towns which are primarily agricultural in nature. Because of the low income levels, social services and infrastructure are mostly inadequate. On account of numerous watershed areas, snow-covered mountains, and large river basins, many villages and towns are located near rivers and water courses. Groundwater, which is available throughout the country in adequate quantities, is used for drinking purposes and is generally of high quality, meeting the national drinking water quality standards with respect to physical, chemical, and bacteriological parameters.

4. Being a mountainous country with numerous rivers and valleys, floods are common in the Kyrgyz Republic. Major floods occur particularly in the south. The drainage systems are usually inadequate to deal with floods and overflows carrying dirt and polluted waters.

5. Lack of proper sanitation in rural areas is reflected in the increased incidence of waterborne and excreta-related diseases. Disposal of human wastes in the villages is through rudimentary pit latrines, which are odorous and unhygienic. Every household has a temporary pit latrine where the superstructure is made of materials such as wood, corrugated asbestos, or other materials. Planks of wood are used to squat on, and when the unlined pit is full the structure is shifted to another location. Likewise, the school toilets, which have rudimentary septic tanks, are also in poor condition. Pit latrines and septic tank overflows are allowed to percolate into the ground. Other wastewater from the rural houses is disposed of into the drainage ditches.

C. Impacts and Measures

6. Overall, the supplementary grant will improve health through financing the provision of safe water supply and the improvement of sanitation systems. Identified negative impacts during construction are moderate in extent and can be mitigated. Potential environmental impacts associated with the design, construction, and operation of the water supply and sanitation system include (i) location-specific impacts related to the pipeline routes, (ii) risk of contamination of the sources, and (iii) rehabilitation and construction of sewer pipelines and sanitation facilities. All potential environmental impacts and respective mitigation measures are listed in Table A4.3.

D. Implementation Framework and Staffing

7. The government institutions responsible for the implementation of the proposed Project include the Department of Rural Water Supply (DRWS) as the executing agency and the project coordination committee comprising representatives from DRWS, the National Agency for Local Self-Government (NALSG), the Ministry of Finance, and the Ministry of Health. The supplementary grant will be implemented by the project management unit (PMU), NALSG, and the Republican Centre for Health Promotion—the implementing agencies. Locally the community drinking water users' unions (CDWUUs), village health committees, and the *ayil okmotu* (village administration) will oversee the project planning, design, and implementation. Institutional responsibilities are summarized in Table A4.1. The PMU will be responsible for overseeing preparation of the initial environmental examinations (IEEs) and respective environmental management plan (EMPs). The PMU will seek the clearance of the IEEs and EMPs from the Ministry of Environmental Protection or ADB, as appropriate, prior to bid issuance.

E. Environmental Monitoring and Reporting

8. Water quality sampling will be conducted seasonally at time of discharge, commencing 1 year before construction to establish a baseline. During operation, a water quality monitoring plan shall be implemented. All samples must adhere to the sanitary and epidemiological services of the Ministry of Health's guidelines. Environmental management shall include procedures for (i) workers' health and safety, and (ii) waste disposal and chemical handling for construction wastes. The PMU assisted by the domestic environment consultant will oversee EMP implementation, and prepare and submit the annual environmental monitoring report to ADB.

Table A4.1: Institutional Responsibility Matrix

Organization		
Primary	**Secondary**	**Responsibilities**
Project Management Unit (PMU)	DRWS (Chair) and Project Coordination Committee	Review environmental clearance of physical investments Provide guidance for upholding environmental policy requirements Submit annual environmental performance report during project implementation
PMU	DRWS	Undertake overall coordination with government entities and supervision Submit initial environmental examinations (IEEs), environmental management plans (EMPs), and environmental clearance contracts to the Ministry of Environmental Protection (represented by the State Agency on Environmental Protection and Forestry)
PMU	DRWS	Establish environmental classifications of subprojects and determine when subproject IEEs are required Ensure environment-related information is disclosed to affected people in accordance with ADB *Public Communications Policy* (2005) before or during the consultation Prepare and submit subproject IEEs to the Ministry of Environmental Protection (MEP) Prepare subproject environmental monitoring and management plans for MEP approval Ensure environmental clearance approval and compliance with regulations Oversee water quality monitoring and reporting to MEP and local governments Implement environmental mitigation and monitoring measures Undertake civil work surveys Consult the public and/or convene community focus groups Undertake remedial action when unexpected environmental impacts occur Prepare the annual environmental monitoring report and submit to ADB
PMU Consultant	Domestic Social and Environmental Specialist and Environmental Engineer	Assist the PMU in classifying the project and preparing IEEs and EMPs Ensure environmental clearance conditions for MEP approval Incorporate environmental requirements in civil work contracts Update and implement environmental mitigation measures Provide environmental training and oversee information disclosure and public consultation Assist the PMU in preparing the annual environmental monitoring report for submission to ADB
Local Governments		Coordinate with PMU and make key decisions on behalf of the community and community drinking water users' unions
ADB		Review IEE and EMP for subprojects costing more than $300,000 and undertake post-facto review for any other subprojects Ensure that the EMPs form a part of the contract document for civil works

ADB = Asian Development Bank, DRWS = Department of Rural Water Supply, EMP = environmental management plan, IEE = initial environmental examination, MEP = Ministry of Environmental Protection, PMU = Project Management Unit

Source: Asian Development Bank.

F. Public Consultation and Information Disclosure

9. According to the fundamentals of the Kyrgyz Republic Law on Ecological Expertise, every citizen has a right to request complete information concerning the environmental situation with regards to new construction projects. The PMU is required to disclose environmental information in a form, manner, and language acceptable to those being consulted by the Project. The PMU will consult with the community through public meetings with each subproject community and take into account the communities' environmental concerns with regard to the Project.

G. Budget and Resources

10. A total of $90,000 (about 0.25% of total project cost), including the cost of recruiting a national social and environmental specialist and an environmental engineer, will be allocated to the implementation of the environmental monitoring and management plan (Table A4.2).

Table A4.2: Estimated Costs of Environmental Monitoring and Management

Role	Input in Person-months	Rate ($)	Total Estimated Cost ($)
Domestic Social and Environmental Specialist	30	1,500	**45,000**
Environmental Engineer	30	1,500	**45,000**
Total			**90,000**

Note: Costs for environmental mitigation should be budgeted as shown in Table A4.3.

Table A4.3: Summary of Environmental Impacts, Mitigation Measures, and Monitoring Plan

Project Activity and Potential Impacts	Proposed Mitigation Measures	Monitoring	Responsible Institutions
Design and Location Phase			
Source Abstraction Development of spring source will reduce quantity of water available	Perform detailed design to show necessary abstraction limit for communities during dry season Undertake confirmatory flow measurements on spring source in two annual dry seasons Consult with community irrigation department to confirm irrigation needs	Inspection of feasibility studies, IEEs, project designs, and contract documents.	PMU and respective PIUs
Source Protection Inadequate protection of intake works, leading to pollution of raw water supply	Cap source to prevent entry of polluted surface water Provide a protection buffer zone of at least 100 meters upstream of the intake and its immediate catchment, and restrict access Undertake confirmatory water quality tests each season (four tests) prior to scheme construction Monitor and control activities in upstream catchment	Inspection of feasibility studies, IEEs, water quality test results, project designs, and contract documents.	PMU and respective PIUs
Damage to Soil, Land, Ecology, Heritage Soil erosion, land instability, and damage to forests or vegetation due to construction of sewer and water pipelines	Mainly confine subproject works to previously disturbed areas, access roads, and tracks Avoid environmentally sensitive sites and those that would have negative impact on cultural heritage such as cemeteries Use flexible polyethylene pipe for raw water transmission main, enabling pipeline to be routed around trees, obstructions, and potentially unstable or erodible areas Minimize excavation and vegetation disturbance Provide slope stabilization and improve drainage where necessary Avoid constructing new access roads for water intakes, pipelines, and reservoirs, but provide small access tracks for light vehicle access during construction and walking tracks for O&M of completed facilities Undertake construction by manual labor in steep areas to minimize ground disturbance and erosion	Inspection of feasibility studies, IEEs, project designs, and contract documents.	PMU and respective PIUs
Damage to Crops and Tree Plantations Damage to tree plantations and crops due to construction activities	Avoid or minimize resettlement and damage to crops or plantations by adopting suitable locations and alignments for project facilities and pipelines Use flexible polyethylene pipe for raw water transmission main, enabling pipeline to be routed around crops or trees Provide adequate compensation in line with ADB and Government resettlement policies	Inspection of feasibility studies, IEEs, project designs and contract documents.	PMU and respective PIUs
Treated Water Quality Safeguard quality of treated	Cover, ventilate, and fence all treated water reservoirs	Inspection of feasibility studies, IEEs, project	PMU and respective PIUs

Project Activity and Potential Impacts	Proposed Mitigation Measures	Monitoring	Responsible Institutions
water	Design distribution network for minimum residual pressure of at least 10 meters to prevent entry to mains of contaminated groundwater or backflow Provide adequate spare parts Design disinfection units to enable one unit to be taken offline for maintenance without disrupting plant operation	designs, and contract documents.	
Design of Sewer and Water Pipelines Sewage leakage into potable water	In the case of sewage leakage, the village authorities have been reminded that the new water pipelines must be constructed at a higher elevation than the sewer pipelines and in different trenches to the water pipelines to prevent leakage of sewage into the water supply Water pipes should be constructed with polyvinyl chloride (PVC) or high-density polyethylene (HDPE) on a sand bed or with steel. If they are constructed with steel, anticorrosion protection must be implemented on the pipeline	Inspection of feasibility studies, IEEs, project designs, and contract	Technical design consultant and PMU
Increased Sewage Generation Increased sewage due to higher water use	Improved water supplies will result in an inherent increase in the generation of wastewater. It is recommended to perform more detailed design calculations for the potential impacts of increased sewage generation in each community to verify that septic tanks, irrigation channels, and open-pit latrine infiltration rates can accept increased flows.	Inspection of feasibility studies, IEEs, project designs, and contract	Technical design consultant, and PMU
Construction Phase			
Air and Noise Pollution, Congestion Noise and dust generation from construction activities Traffic congestion and disturbance to community and businesses	Limit night time work in populated areas Avoid use of vehicles and/or equipment with excessive exhaust or noise emissions; install/maintain silencers Regularly water down road surfaces Do not burn waste on the construction site Provide secure covers to trucks carrying spoil or fine-grained construction materials Cover disturbed surfaces with mulch Carry out construction in sections, give adequate notice of construction activities, provide effective road signs, diversions, or barricades Community participation in subproject design will minimize disruption to community social and economic activities Include appropriate clauses in construction contracts	Daily site inspection	Construction contractor, technical supervision consultant, PMU, and respective PIUs
Health and Safety Hazards for members of public and construction workers	Install barrier fencing around construction site Control access of unauthorized persons to site Provide first aid and safety training to construction staff	Daily inspection throughout construction stage. Monthly inspection of accident reports and complaints register	Construction contractor, technical supervision consultant, PMU, and respective PIUs

Project Activity and Potential Impacts	Proposed Mitigation Measures	Monitoring	Responsible Institutions
Protect Soil, Land, and Ecology Soil erosion and sediment transport Damage to land due to inappropriate disposal of construction wastes Damage to stream beds and banks from extraction of construction materials Impairment of water quality by spoil disposal Groundwater and surface water contamination by oil and grease	To prevent soil erosion, administer an initial retention fee to contractors. They will be able to collect their deposit once they have cleaned up and revegetated or covered exposed areas created during construction Install appropriate slope protection works Minimize vegetation clearance and minimize the time during which excavations are open Rehabilitate disturbed surfaces as soon as possible after completion of construction activity Dispose of spoil in designated spoil areas, and topsoil, grass, and landscape spoil heaps Minimize extraction of construction materials from rivers and stream beds Avoid tipping cut spoil directly into watercourses or over the edge of roads Collect, store, and dispose of materials appropriately Store oil, grease, fuel, and bitumen on a sealed surface, away from rivers and streams Construct silt ponds and install silt retention barriers in drains to prevent run-off Redirect surface run-off around construction areas Include appropriate clauses in construction contracts	Daily inspection throughout construction and contract maintenance stage	Construction contractor, technical supervision consultant, PMU, and respective PIUs
Operations Phase			
Operational Handling of Chlorine Chlorine hazards	Chlorine is explosive, corrosive, and incompatible with moisture, steam, and water. Store chlorine in a cool, dry, well-ventilated area in tightly sealed containers. Operators must be trained in the appropriate means of handling chlorine prior to working with the liquid, gas, or powder.	Monthly inspection of operation and maintenance records	Ayil okmotu and CDWUU
Health and Safety Hazards for CDWUU and the public	Ongoing training programs for first aid and occupational health and safety training to DRWS Undertake periodic inspections of electrical equipment by qualified staff and periodic safety audits	Monthly inspection of complaints register and safety records	Ayil okmotu and CDWUU
Sustainability of Infrastructure Systems Efficiency and reliability of water supply and sewerage systems	Provide adequate budgets and undertake planned maintenance programs in accordance with specific O&M plans Provide vocational training for CDWUU staff Undertake periodic leak detection and repairs Undertake planned cleaning of village drains and dispose of sludge to designated disposal sites	Monthly inspection of operation and maintenance records	Ayil okmotu and CDWUU

Project Activity and Potential Impacts	Proposed Mitigation Measures	Monitoring	Responsible Institutions
	Village communities will maintain village environmental improvements with PMU		
Delivery of Unsafe Water Water quality violation	In the event that poor quality water is delivered to the consumers due to insufficient treatment, the community or the CDWUU must put into effect a mitigation plan. At first, the sample must be collected again to ensure that the operators have not made any operational errors. If the sample has exceeded or gone below the allowable Ministry of Environmental Protection approved standards, the region is localized by stopping water supply to the customers. The pipelines are disinfected with chlorine and the water is further disinfected with chlorine. The water will be distributed to the region once tests demonstrate good water quality results and sufficient disinfection.	Inspection of feasibility studies, IEEs, project designs, and contract	Ayil okmotu and CDWUU

ADB = Asian Development Bank, CDWUU = community drinking water users' union, DRWS = Department of Rural Water Supply, EMP = environmental management plan, HDPE = high-density polyethylene, IEE = initial environmental examination, MEP = Ministry of Environmental Protection, PIU = project implementation unit, PMU = project management unit, PVC = polyvinyl chloride.

Budget Comments:

1. Environmental impacts related to location: costs for environmental inspection should be included in the 5% of the time for construction inspectors.
2. Environmental impacts related to design: environmental mitigation costs related to the design should be included in the costs for final design.
3. Environmental impacts related to surface and groundwater quality: include estimated costs for groundwater investigations and water quality testing in the estimated base cost.
4. Environmental impacts related to construction: costs for environmental mitigations related to the overall construction activities should be included in the civil works costs and procurement (e.g., flexible polyethylene pipe, fence, etc.).
5. Environmental impacts related to handling and operation: costs for environmental monitoring and training should be included in the overall environmental monitoring and management costs and part of the overall costs for capacity-building program.

Source: Asian Development Bank.

RESETTLEMENT FRAMEWORK

A. Project Description

1. The Community-Based Infrastructure Services Sector Project[1] (the Project) follows a sector lending approach and supports the Government's main objective of human development by providing (i) improved community-based infrastructure services, and (ii) training programs to develop institutional capacity. The project area covers four *oblasts* (provinces)—Chui, Jalal-Abad, Osh, and Batken. The Project was designed to provide basic infrastructure services in 730 villages and 7 small towns to about 1.5 million persons, of whom about 70% were living below the poverty line.

2. The proposed supplementary grant is required to meet the financing gap that has emerged due to significant increases in construction costs during the implementation period. As a result, the scope of the rural water supply and sanitation component was reduced from the originally planned 240 subprojects to 118 subprojects, and the balance dropped. The proposed supplementary grant will implement the remaining 122 subprojects within the original scope, providing much-needed water supply and sanitation services for the rural population as prioritized by the Government. Based on the lessons learned from the Project, proposed changes include (i) simplification of the subproject selection criteria to ensure the selection of community-owned, demand-driven, and cost-effective subprojects; (ii) improvement of technical design criteria for implementing simple, technically sound, and cost-effective subprojects; and (iii) improvement of implementation arrangements to achieve efficiency and quality during project implementation.

3. The objective of the supplementary grant is to improve living standards, environment, and public health by financing safe, reliable piped water supply and sanitation (WSS) facilities in about 200 villages in four oblasts, which is expected to benefit about 300,000 people. The Department of Rural Water Supply (DRWS) will be the executing agency for the Project. The existing project management unit (PMU) at DRWS will continue to provide overall coordination. The National Agency for Local Self-Government (NALSG) and the project implementation units (PIUs) already established at oblast level will jointly implement the Project.

4. Small-scale WSS subprojects will consist primarily of a network of underground pipelines, water intake, storage reservoirs, and wastewater disposal. By their very nature these works will be constructed in the public rights-of-way. However, land will be required in small parcels for the purposes of water source development, overhead reservoirs, the water transmission lines, and wastewater disposal works. Experience from the Project has shown that communities or individuals always volunteered their land (e.g., unutilized community-owned land) for these small facilities that benefit them directly. This was also confirmed during the special loan review mission in May 2008 through a study of 45 selected subprojects. Further, the subproject selection criteria also require that there is no occupation on the land and it has no severe impact to any individual.

5. **Subproject Selection.** Each subproject will be selected in accordance with the criteria detailed in the main text of this report.

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[1] ADB, 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project*. Manila.

B. Purpose of the Resettlement Framework

6. Since no legal and policy frameworks of the Kyrgyz Republic exist for land donation, this resettlement framework sets out the procedure for land donation from individuals who are willing to contribute their lands voluntarily.

C. Voluntary Contributions

7. Where local communities or individuals elect to make voluntary contribution of affected land without compensation in accordance with traditional practices, this shall be acceptable only if the following safeguards are in place:

(i) Confirming that a full consultation with landowners and any non-titled affected people on site selection was conducted;
(ii) Ensuring that voluntary donations do not severely affect the living standards of affected people, and are linked directly to benefits for the affected people, with community sanctioned measures to replace any losses that are agreed to through verbal and written record by affected people;
(iii) Confirming any voluntary donation through written record and notarized such as through a designated nongovernment organization or legal authority;
(iv) Indicating the time period of effectiveness and the conditions of the servitude;
(v) Attaching the location of the servitude to the contract; and
(vi) Placing adequate grievance redress mechanisms.

D. Institutional Arrangements

8. For compliance with the Asian Development Bank's (ADB's) social safeguard policies in the project activities, the Project's executing agency, DRWS through its PMU, will have the overall coordination and responsibility for land donation activities under the Project. A project coordination committee—comprising representatives from DRWS, NALSG, the Ministry of Finance, and the Ministry of Health—will meet at 6-monthly intervals (or earlier if needed) to oversee project implementation and provide decision-making support on all aspects of the Project. A district project implementation review committee will monitor compliance of the laid down procedures for land donations from individuals who are willing to contribute their land voluntarily.

9. The implementation of land donation activities in the subprojects will be supported by social safeguard specialists of the technical design consultancy at PIU level and facilitated by the *ayil okmotu* (Village Administration). Community facilitators of the PIUs will also assist the social safeguard specialist in the land donation activities, when required.

10. Community drinking water users' unions (CDWUU) will be established with assistance and support by community facilitators in every village of the project sites. The CDWUUs will receive support from community facilitators to increase their social awareness and technical capacity for implementing the project activities.

11. Institutional assessment of DRWS and the PIUs have concluded that DRWS is capable of dealing with resettlement issues, since it has accumulated resettlement experience through current and completed rural water supply improvement and construction works throughout the country. DRWS has access to lawyers experienced in resolving resettlement issues with community heads and community members.

E. Disclosure, Consultation, and Grievances

12. Land donations would be carried out in close consultation with all stakeholders and in line with the resettlement framework. It will involve focus group discussions and community meetings especially, with the individuals who are willing to contribute their land voluntarily. The PIUs and ayil okmotu will be responsible for disseminating the information on the status of land donations to all stakeholders including all the beneficiaries of the subproject. The resettlement framework will be included in the project implementation guidelines to be used by social safeguard specialists, community facilitators, CDWUUs, PIUs, and ayil okmotu. Copies of the resettlement framework will be available in the local government and CDWUU's offices and will be posted on the ADB and Project websites.

13. Any affected person will have the right to file complaints and/or queries on any aspects of the land donation activities of the subprojects. At the village level, complaint from any affected person can be filed with the CDWUU's members and/or ayil okmotu for an immediate solution. If the problem cannot be solved, the CDWUU's members and ayil okmotu staff will facilitate the affected persons to submit their complaints to the Project's grievance and redress committee at the district level. Community facilitators will record the complaint and report to the PIUs. The Project will dedicate district staff to be in charge of handling and following up on affected persons' complaints.

14. The grievance redress committee will comprise one representative each from the respective PIU, CDWUU, and ayil okmotu; affected persons; and relevant government officials with functional and legal authority. The committee will review grievances involving all issues. Grievances will be redressed within 2–4 weeks from the date of lodging the complaints at the district level.

15. Complaint and grievance procedures and guidelines will be included in the project implementation guideline to be disseminated by the community facilitators to the affected communities during the facilitation process and project implementation.

F. Monitoring and Evaluation

16. The project monitoring and evaluation mechanism for land and social safeguard issues will be included in the internal monitoring and evaluation report prepared by the executing agency. One section of the regular internal monitoring report will be dedicated to reporting and discussing issues related to social safeguards in project activities.

17. The district multistakeholder steering committees will serve as the external monitoring agencies of the Project. The external monitoring activities specifically focusing on this issue will be conducted twice a year during the project implementation period. Monitoring reports will be posted on ADB's website.

LETTER OF CONSENT FOR VOLUNTARY LAND DONATION

By

Mr/Ms/Mme. _____ resident of village _____, Oblast _____ herein after called the party No. 1 and transferor, the owner of the land plot sized ___ Sq. meter, Plot No_____, according to the revenue record of _____ Oblast

In favor of

the ayil okmotu of village _____ Oblast _____ herein after called the party No.2 and transferee of the land plot sized ___ Sq. meter, Plot Number _____, according to the revenue record of Village _____ Rayon _____ and Oblast _____, for the subproject under Community-Based Infrastructure Services Sector Project for the village, registered under number _____ dated _____, represented by the Chairman and secretary by designation.

1. I, the party No.1 and the transferor, hereby provide certification regarding my true ownership of the land and agree to voluntarily transfer by way of donation the ownership of land or portion of the land, plot sized ___ , Number _____ according to the revenue record of _____ Rayon _____ and Oblast _____, in the name of ayil okmotu, the party No.2 and the transferee, for any community development purpose including the construction of overhead reservoir (OHR), oxidation pond/s and pump house under the said subproject. Typical sizes for the OHR, oxidation pond and pump house are 25 sq. meter, 75-250 sq. meter, and 20 sq. meter respectively.

2. I, the party No.1 and the transferor, will not be liable for any claims made by any individual, group or government department in relation to the construction, operation, or maintenance of the sub-project, after the date hereof.

3. I, the party No. 1 and the transferor, also confirm that I do not request any compensation for this transfer and would request the local authority to consider this as my contribution and donation to the Project.

Signed between Party No.1 and Party No. 2 in the presence of Witnesses mentioned below.

Transferee	Transferor
(Name and ID No)	(Name and ID No)
Ayil Okmotu	_____
Secretary _____	Resident of Village ……
Community-Based Infrastructure Services Subproject	
Village _____, Oblast _____	
Witness-1(Name and ID)	Witness-2(Name and ID)

DETAILED COST ESTIMATES AND FINANCING PLAN

($million)

Cost Category / Item		Total Cost	ADB Financing		Government Financing		Community Financing	
		Total	Total	% Financing	Total	% Financing	Total	% Financing
1	**Civil Works**							
1A	Water Supply and Sanitation (New)	21.40	19.80	92.52	0.25	1.17	1.35	6.31
1B	Water Supply Rectification Works	2.00	2.00	100.00	-	-	-	-
	Total - Civil Works	**23.40**	**21.80**	**93.16**	**0.25**	**1.07**	**1.35**	**5.77**
2	**Equipment and Material**							
2A	CDWUU Equipment for New Works	1.00	1.00	100.00	-	-	-	-
2B	CDWUU Equipment for Rectification Works	2.00	2.00	100.00	-	-	-	-
	Total - Equipment and Material	**3.00**	**3.00**	**100.00**	**-**	**-**	**-**	**-**
3	**Vehicles**							
3A	PMU Vehicles	0.15	0.15	100.00		-		-
4	**Training and Capacity Building**							
4A	Community Awareness and Participation Program	0.50	0.50	100.00	-	-	-	-
4B	Hygiene and Sanitation Education Program	0.50	0.50	100.00	-	-	-	-
4C	Asset Management and Strengthening Program	0.50	0.50	100.00	-	-	-	-
	Total - Training and Capacity Building	**1.50**	**1.50**	**100.00**	**-**	**-**	**-**	**-**
5	**Consulting Services**							
5A	Community Mobilization Consultancy	0.30	0.30	100.00	-	-	-	-
5B	Technical Design Consultancy	0.75	0.75	100.00	-	-	-	-
5C	Technical Supervision Consultancy	0.45	0.45	100.00	-	-	-	-
	Total - Consulting Services	**1.50**	**1.50**	**100.00**	**-**	**-**	**-**	**-**
6	**Project Management**							
6A	Incremental Administration	1.75	0.60	34.29	1.15	65.71	-	-
6B	Office Management Expenses	0.60	0.60	100.00	-	-	-	-
	Total - Project Management	**2.35**	**1.20**	**51.06**	**1.15**	**48.94**	**-**	**-**
7	**Contingencies**	1.00	0.85	85.28	0.15	14.72	-	-
8	**Taxes and Duties**	4.60	-	-	4.60	100.00	-	-
	Grand Total	**37.50**	**30.00**	**80.01**	**6.15**		**1.35**	
	Percentage of Project Cost (%)		80.01		16.39		3.60	

CDWUU = community drinking water users' union, PMU = project management unit.

Source: Asian Development Bank estimates.

LEGAL, REGULATORY, AND SERVICE SUSTAINABILITY FRAMEWORK

1. **Legal and Regulatory Framework.** The Constitution, the Water Code, and other legislation related to drinking water supply and local self-governments provide the basis for long-term sustainability of water and sanitation services in the country—in the above order of priority.

(i) Chapter 4 of the Kyrgyz Republic Water Code (2005) lays down the legal and regulatory framework for abstraction and use of water resources, which prescribes the use of water for drinking and domestic purposes and the use of sewage and wastewater for irrigation.

(ii) Article 5 of the Kyrgyz Republic Drinking Water Law (1999) prescribes the responsibility of local administration bodies and the local state administration in the areas of water supply to the population. The local bodies are inter alia responsible for planning, financing, implementing, and overseeing works related to development of water and sanitation services, and setting tariffs to recover operation and maintenance costs.

(iii) Article 18 of the Law of the Kyrgyz Republic on Local Self-Government and Local State Administration (2008) defines the role of local bodies and indicates that the affairs of local significance inter alia comprise drinking water supply, and ensuring operations of sewerage systems and treatment plants.

2. **Service Sustainability.** Service sustainability under the supplementary grant financing is determined by the technical, institutional, and financial sustainability of the proposed implementation arrangement. Under the initial project, the Department of Rural Water Supply (DRWS) provided project management and implementation support to multilateral-funded rural water supply projects for water supply and sanitation (WSS) asset creation; there is no mandate for DRWS to ensure WSS service delivery. Asset management, service delivery, and asset strengthening post-construction were the responsibility of the community drinking water users' union (CDWUU). Being a nonprofit organization with limited financial capacity and absence of an accountable relationship with the local self-government, reliance on the CDWUU to ensure long-term service delivery is not likely to provide a sustainable solution in the long term. Based on the prevailing legal and regulatory framework, the WSS service is more likely to be sustainable over the long term based on the following:

(i) **Technical sustainability.** Involvement of the community and the *ayil okmotu* (village administration) along with the DRWS project management unit (PMU) in project planning, designing, financing, and implementation is more likely to result in locally acceptable and sustainable technical solutions. The ayil okmotu's participation through the project period will ensure that the asset handover at subproject completion is smooth, and system component and condition is acknowledged by the ayil okmotu.

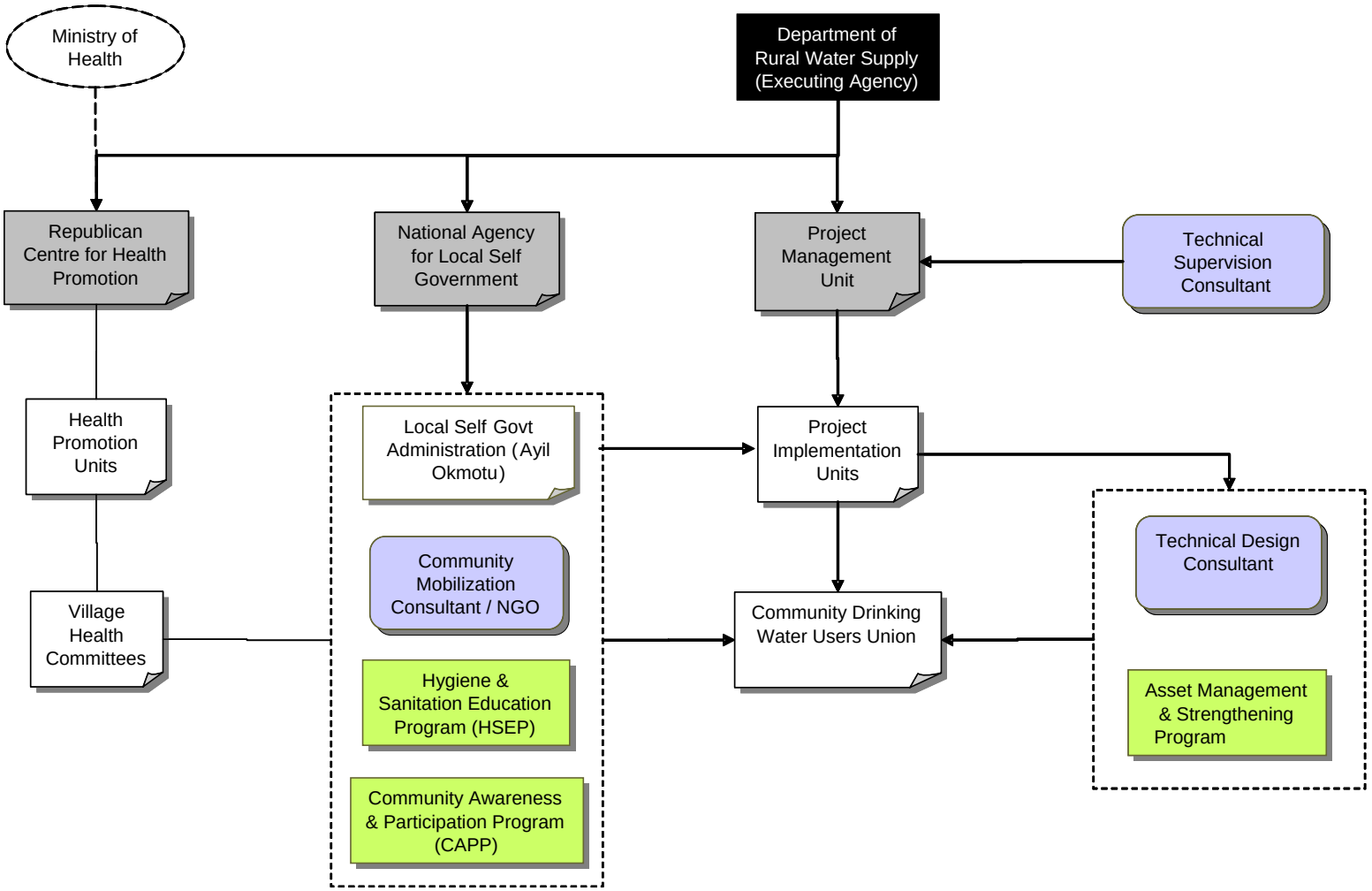
(ii) **Institutional sustainability.** While asset ownership will rest with the ayil okmotu (notwithstanding the equity contribution in capital expenditure by the community), a service delivery agreement between the ayil okmotu and the CDWUU is more likely to result in efficient services with a financial commitment by the ayil okmotu to provide financial support for any major breakdown in the system and long-term capital investment planning. DRWS would provide technical solutions and asset creation oversight in the long-term, subject to the ayil okmotu's demand for system

expansion and capital investment plans. Delegating service delivery to the CDWUUs is a pragmatic option considering the geographical spread of the villages thereby avoiding the need to strengthen the ayil okmotu with additional human resources centrally and incurring additional expenditure on personnel management.

(iii) **Financial sustainability.** The current tariffs cover various taxes levied on the CDWUU and the debt-servicing component towards capital expenditure. By delegating the service delivery responsibility to the CDWUU, the ayil okmotu may approve a tariff to ensure cost recovery for operation and maintenance but continue to be responsible for service delivery. The tariffs are likely to be more affordable and the ayil okmotu may then limit its role to strategic and financial planning for system breakdown maintenance and long-term capital investment planning.

3. Given the underlying legal, regulatory, and service sustainability frameworks, project execution under the supplementary grant financing will be through DRWS with a long-term mandate for WSS sector development, providing the policy directive and financial support to the sector. The existing joint PMU at DRWS will continue to provide overall coordination. The National Agency for Local-Self-Government (NALSG) and the project implementation units already established at *oblast* (province) level will jointly implement the Project. The PMU and the project implementation units will ensure asset creation and capacity building of the CDWUUs in asset management and strengthening. NALSG will ensure ayil okmotu participation in the project cycle and commitment to meet WSS service delivery obligations. With the help of the PMU, NALSG will elicit ayil okmotu and CDWUU participation through community awareness and participation, and hygiene and sanitation education programs. A project coordination committee, comprising representatives from DRWS, NALSG, the Ministry of Finance, and the Ministry of Health, will (i) meet at 6-monthly intervals (or earlier if needed), (ii) oversee project implementation, and (iii) provide decision-making support on all aspects of the Project. As a long-term sector development strategy, the Kyrgyz Republic is actively reviewing the water policy (prepared by the Department for International Development of the United Kingdom) where a strong emphasis is laid on local self-government involvement in service delivery.

REVISED PROJECT IMPLEMENTATION ARRANGEMENTS

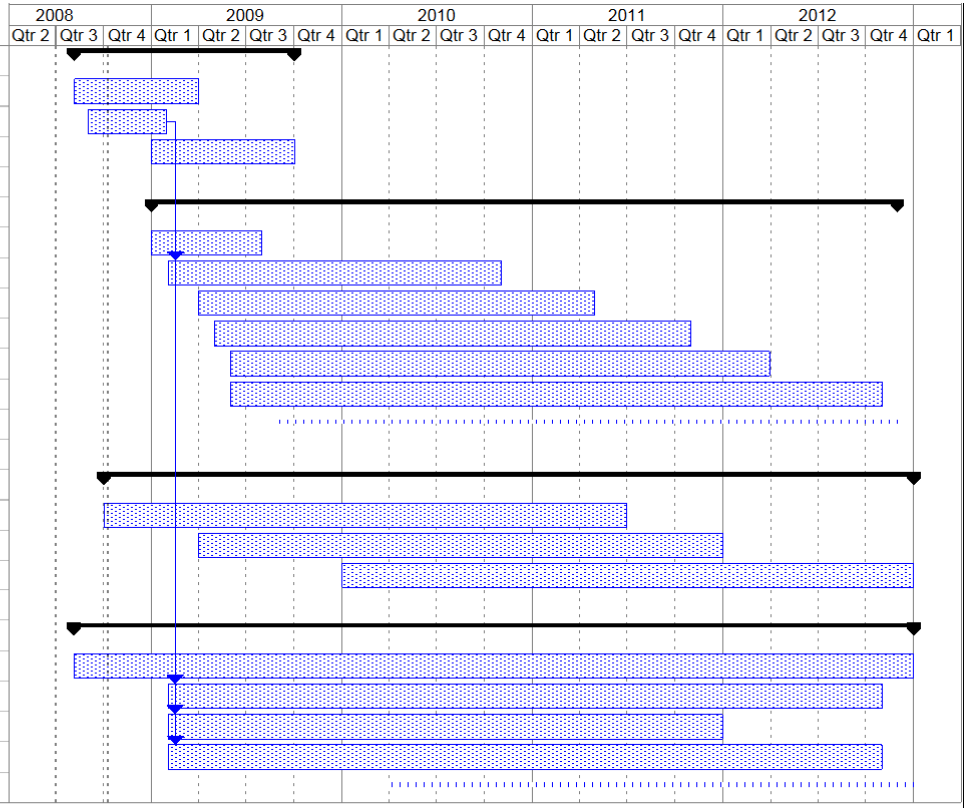


NGO = non-governmental organization.

Sources: Asian Development Bank and Project Management Unit.

REVISED PROJECT IMPLEMENTATION SCHEDULE

ID	Task Name
1	**Project Preparatory Activities**
2	Implementation of Rectification Works
3	Consultants Selection
4	CBO Formation and Community Mobilization
5	
6	**Part A: Physical Infrastructure**
7	Contract Award of Already Designed Subprojects
8	Subproject Identification and Pre-feasiblity Studies
9	Surveys, Investigations and Feasiblity Studies
10	Detailed Engineering Designs
11	Bid Process Management
12	Asset Creation - Water Supply and Sanitation
13	Procurement of O&M Equipment
14	
15	**Part B: Capacity Development**
16	Community Awareness & Participation Program
17	Hygiene & Sanitation Education Program
18	Asset Management & Strengthening Program
19	
20	**Part C: Project Assistance Facility**
21	Project Management & Administration
22	Technical Supervision Consultancy
23	Community Mobilization Consultancy
24	Technical Design Consultancy
25	Project Performance Management System



Legend | Task | Split | Milestone | Summary

CBO = community based organization, O&M = operation and maintenance
Source: ADB and Project Management Unit estimates.

PROCUREMENT PLAN

Table A10.1: Project Information

Item	Information
Project Name	Community-Based Infrastructure Services Sector Project
Grant Number	To be decided
Grant Amount	$30 million
Executing Agency - Grant	Department of Rural Water Supply
Date of Original Procurement Plan	-
Date of most recent Procurement Plan	-

A. Process Thresholds, Review and 18-Month Procurement Plan

Table A10.2: Procurement of Goods and Works

Method	Threshold
International Competitive Bidding for Works	> $1,000,000
International Competitive Bidding for Goods	> $500,000
National Competitive Bidding for Works	Beneath that stated for ICB, Works
National Competitive Bidding for Goods	Beneath that stated for ICB, Goods
Shopping for Works	Below $100,000
Shopping for Goods	Below $100,000

Table A10.3: Review of Goods and Works

Procurement Method	Prior or Post	Comments
ICB Works	Prior	All documents will be based on ADB standard bidding documents
ICB Goods	Prior	
NCB Works	Post	
NCB Goods	Post	
Shopping for Works	Post	
Direct Contracting for Goods	Prior	
Works through Force Account	Prior	
Shopping for Goods	Post	

Table A10.4: Recruitment of Consulting Firms and Individuals

Procurement Method	Prior or Post	Comments
Quality- and Cost-Based Selection (QCBS)	Prior	Recruitment of technical supervision consultants, technical design consultants and community mobilization consultants
Individual Consultants	Prior	-

Table A10.5: Proposed Procurement Activity for Consultants

General Description	Contract Value	Recruitment Method	Advertisement Date (quarter/year)	International or National Assignment	Comments
Community Mobilization Consultancy	$300,000	QCBS 80:20	Q3/2008	National	Two firms—one each in the north and south
Technical Design Consultancy	$750,000	QCBS 80:20	Q3/2008	National	One firm
Technical Supervision Consultancy	$450,000	QCBS 80:20	Q3/2008	National	One firm with two international consultant positions, or two individual international consultants (68 person-months for international)

Table A10.6: Proposed Procurement Activity for Small Contracts

General Description	Value of Contracts (cumulative)	Number of Contracts	Procurement / Recruitment Method[1]	Comments
Rectification Works	$2,000,000	30	NCB and Shopping (for Works)	-
Water Supply and Sanitation Works	$6,000,000	15	NCB Works	-

B. Project Procurement Plan

Table A10.7: Indicative Procurement and Recruitment List

General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Recruitment Method	Domestic Preference Applicable	Comments
Goods					
CDWUU Equipment	$3,000,000	4	NCB for Goods	-	-
Vehicles for Transportation	$150,000	1	NCB for Goods	-	-
Office Equipment	$100,000	4	Shopping for Goods	-	-
Works					
Water Supply and Sanitation	$28,000,000	Multiple	NCB	-	-

General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Recruitment Method	Type of Proposal	Comments
Consulting Services					
Community Mobilization Consultancy	$300,000	2	QCBS	Biodata Proposal	Firm or NGO
Technical Design Consultancy	$750,000	1	QCBS	Simplified Technical Proposal	Firm
Technical Supervision Consultancy	$450,000	1	QCBS	Biodata Proposal	Firm with two international consultant positions, or two individual international consultants

C. National Competitive Bidding Procedures

1. General

The procedures to be followed for national competitive bidding shall be for tendering with unlimited participation and the two-stage tendering set forth in Law of the Kyrgyz Republic on Public Procurement of Goods, Works and Services effective on April 2004 with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of the ADB Procurement Guidelines.

2. Eligibility

ADB: The eligibility of bidders shall be as defined under section I of ADB's Procurement Guidelines, published by ADB in April 2006; accordingly, no bidder or potential bidder should be declared ineligible to ADB-financed contracts for other reasons than the ones provided by section I of ADB's guidelines. Bidders must be nationals of member countries of ADB, and offered goods, works and services must be produced in and supplied from member countries of ADB.

3. Prequalification

Normally, post-qualification shall be used unless explicitly provided for in the loan agreement/procurement plan. Irrespective of whether post qualification or prequalification is used, eligible bidders (both national and foreign) shall be allowed to participate.

4. Registration and Licensing

(a) Bidding shall not be restricted to pre-registered/licensed firms.

(b) Where registration or licensing is required, bidders (i) shall be allowed a reasonable time to complete the registration or licensing process; and (ii) shall not be denied registration/licensing for reasons unrelated to their capability and resources to successfully perform the contract, which shall be verified through post-qualification.

(c) Foreign bidders shall not be precluded from bidding. If a registration or licensing process is required, a foreign bidder declared the lowest evaluated bidder shall be given a reasonable opportunity to register or to obtain a license.

5. Bidding Period

The minimum bidding period is twenty-eight (28) days prior to the deadline for the submission of bids.

6. Bidding Documents

Procuring entities should use standard bidding documents for the procurement of goods, works and services acceptable to ADB.

7. Preferences

No domestic preference shall be given for domestic bidders and for domestically manufactured goods.

8. Advertising

Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or freely accessible, nationally-known website allowing a minimum of twenty-eight (28) days for the preparation and submission of bids. Bidding of NCB contracts estimated at US$500,000 equivalent or more for goods and related services or US$1,000,000 equivalent or more for civil works shall be advertised on ADB's website via the posting of the Procurement Plan.

9. Bid Security

Where required, bid security shall be in the form of a bank guarantee from a reputable bank.

10. Bid Opening and Bid Evaluation

(a) Bids shall be opened in public.

(b) Evaluation of bids shall be made in strict adherence to the criteria declared in the bidding documents and contracts shall be awarded to the lowest evaluated bidder.

(c) Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations.

(d) No bidder shall be rejected on the basis of a comparison with the employer's estimate and budget ceiling without the Bank's prior concurrence.

(e) A contract shall be awarded to the technically responsive bidder that offers the lowest evaluated price and who meets the qualifying requirements set out in the bidding documents.

(f) No negotiations shall be permitted.

(g) Price verification shall not be applied.

11. Rejection of All Bids and Rebidding

Bids shall not be rejected and new bids solicited without ADB's prior concurrence.

12. Participation by Government-owned enterprises

Government-owned enterprises in Kyrgyz Republic shall be eligible to participate as bidders only if they can establish that they are legally and financially autonomous, operate under commercial law and are not a dependent agency of the contracting authority. Furthermore, they will be subject to the same bid and performance security requirements as other bidders.

13. Right to Inspect/Audit

A provision shall be included in all NCB works and goods contracts financed by ADB requiring suppliers and contractors to permit ADB to inspect their accounts and records and other documents relating to the bid submission and the performance of the contract, and to have them audited by auditors appointed by ADB.

14. Fraud and corruption

a. The Government shall reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the contract in question.

b. ADB will declare a firm or individual ineligible, either indefinitely or for a stated period, to be awarded a contract financed by ADB, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, an ADB-financed contract.

15. National Sanctions List

National sanctions lists may be applied only with prior approval of ADB.

SUBPROJECT SELECTION CRITERIA

A. General Procedure

1. Using applications for improved water supplies from communities in the project area, the concerned *ayil okmotu* will draw up priority lists of subproject communities. The project management unit (PMU) will then assess the needs and demands of the listed communities and their willingness to participate in development, management, and maintenance. The PMU will (i) refine the priority list; (ii) through its community development unit (CDU), hold a series of meetings in each community on the refined list; and (iii) prepare feasibility studies in consultation with the communities. Where a feasibility study meets the selection criteria, DRWS will seek approval of the related ayil okmotu to proceed with detailed design and construction.

2. The departmental subcommittee chaired by the director general of DRWS will approve all subprojects.

B. Proposed Selection Criteria

3. The preparation of the list of communities requiring assistance will be based on current practice, to which new steps have been added to assess the willingness of the communities to participate in the Project and sign a memorandum of understanding (MOU) with advance deposit of their specified cash share. Three selection and screening phases have been devised to arrive at the final list of about 122 subprojects to be financed under the supplementary grant.

1. Preselection of Subprojects

4. According to needs, ayil okmotus will list the communities applying for water supply and sanitation within the four *oblasts* (provinces) covered by the Project, and forward the list to PMU and DRWS. The main criteria are that

(i) the community is primarily located in an area where there is an acute shortage of water or the existing system of water supply and sanitation is dilapidated and requires major rehabilitation or replacement, and

(ii) the community does not have a water supply and sanitation scheme.

2. Selection of Subprojects

5. During this phase, the CDU, in consultation with each community, will assess the needs and demands as well as the willingness to accept, manage, and maintain the proposed water supply and sanitation schemes. The main criterion for preparing the refined list will be the desire expressed by the community for a water supply and sanitation scheme and their acceptance of capital cost sharing and responsibility for operation and maintenance (O&M) of the scheme (including costs) upon completion. In this respect, the community drinking water users' unions (CDWUUs) will sign an MOU and deposit in the joint bank account with the PMU an amount equivalent to an estimated 2 months O&M expenditure of the scheme, as an initial commitment.

6. Trained CDU staff, comprising a team of one community development officer and two community-based motivators (one male and one female), will conduct needs assessment in each community. The actual needs and expressions of interest in the scheme will be assessed through participatory socioeconomic surveys. The CDU staff will survey each community using participatory techniques to determine, among other things, population and number of households, household income levels, present sources of water, who collects the water, how much time is spent in collecting water, any cost associated with the present source, as well as residents' willingness to pay for O&M of the scheme.

7. The CDU staff will also conduct open-ended interviews with key respondents to identify (i) ethnic groups and community leadership, institutions, and organizations; (ii) the community's self-help development experience; (iii) the residents' perceptions of the success or failure of the Project; and (iv) the community's willingness to assume O&M responsibility.

8. The likelihood of the scheme's success will be assessed based on the residents' ability and willingness to operate and manage the scheme, the level of social cohesion, and evidence of a spirit of self-reliance. The existence of local organizations that could undertake the responsibility, and a level of knowledge and skills related to water supply and sanitation systems, will be positive factors in determining whether the community can be expected to be successful. Training needs for scheme maintenance will be assessed and recommendations made for training the community members before and during subproject construction and subsequent commissioning.

9. For a village or cluster of villages under a subproject where a pump-based water source would be involved, the minimum population should be 1,000 (2007 census). This is required to ensure that the per household tariff remains affordable to the communities.

10. Regarding rehabilitation, only those schemes that have been abandoned for reasons such as nonavailability of canal, river, ground, or spring water source failure, or completed its designed life will be selected. However, schemes abandoned due to nonpayment of electricity bills will not be considered unless the community pays for the arrears. Priority will be given to schemes that require minor rehabilitation or benefit a large population, or where per capita cost is minimal. Project consultants will determine the components of the schemes requiring rehabilitation.

11. For gravity-based schemes and cost-effective small-pump schemes, selection will be based on all conditions defined in paras. 5–10. With regard to the population threshold, selection will be based not on the minimum population size but on the capital cost ceiling as reflected in para. 15.

3. Final Approval of Subprojects

12. The PMU will carry out feasibility studies and prepare cost estimates for communities for which the need assessments indicate that schemes built under a community-based approach are likely to be sustainable. The PMU will assist these communities to form CDWUUs, jointly plan subprojects with their CDWUUs, and finalize the MOU with them. Final selection will be based on the findings of the feasibility studies and compliance with the following criteria:

(i) Suitable technical options have been explored and the availability of a sustainable water source is confirmed through adequate investigation and field tests for the appropriate location, required quantity, and sustained supply of water of acceptable quality.
(ii) A least-cost comparison of technically feasible options has been prepared and the least-cost option is selected.
(iii) The subproject indicates an economic internal rate of return (EIRR) of 12% and/or a benefit–cost ratio (BCR) greater than unity.
(iv) The community is willing to share in the capital cost of the subproject in cash as per established criteria of 5% of the capital cost of the subproject. For very costly schemes the socioeconomic profile of the villages will be worked out to determine an affordability level.
(v) The community is willing to accept responsibility for O&M and is willing to pay for all O&M expenses.
(vi) Maps, plans, and typical sections and details have been prepared to scale, showing the location, scope, and scale of the subproject; a preliminary cost estimate has been prepared; and the CDWUU has signed on the agreed-upon layout and this is countersigned by ayil okmotu.

(vii) Annual O&M costs have been estimated and tariffs to recover the costs established.
(viii) Service affordability and householders' willingness to pay the established tariff have been confirmed.
(ix) An implementation plan has been prepared showing the procedures for land donation, construction, and O&M.
(x) Necessary rights-of-way, water rights, and land requirements have been, or can be, finalized; and an MOU has been signed by the communities with regard to voluntary transfer of land to CDWUU (Appendix 12) for the development of an overhead reservoir (if required), water source development, or water transmission lines for wastewater disposal.
(xi) Environmental impacts have been examined, an initial environmental examination or an environmental impact assessment has been prepared, and mitigating measures have been proposed.

13. If a subproject's feasibility study meets requirements (i)–(xi), the relevant authorities will approve the subproject and the PMU will proceed with design and construction of the water supply and sanitation subproject in consultation with the local community. Only subprojects for which land requirements have been satisfied will be included in the program.

14. Affordability to the community and willingness to pay for its scheme's O&M costs will be an important factor in scheme design and service level. For gravity-based schemes, which are located mostly in mountainous areas and where houses are spread out, standposts and water tanks will be provided in the villages instead of household connections, to make cost-effective subprojects. In case of pump subprojects, however, individual household connections will be viable in terms of tariff collection and should be preferred; however, communities may opt to have community tanks and standposts instead. Further, to ensure that only cost-effective schemes are built and capital costs of subprojects remain within certain limits, on the basis of extensive analysis during project preparation, it was agreed that the per capita capital cost of different types of schemes will not exceed the following ceilings (2008 prices):

(i) For new pumping water supply and sanitation (WSS) schemes: Som2,800 ($80).
(ii) For new gravity-based WSS and minor schemes: Som1,800 ($50).

C. ADB Involvement in the Approval of Subprojects

15. The feasibility studies (including cost estimates and economic and financial justification) of each subproject for which the estimated total cost exceeds $300,000 equivalent will be forwarded to the Asian Development Bank (ADB) for approval before implementation. All other schemes, provided they meet the selection criteria, will be constructed without prior ADB approval, but ADB's review missions will audit these schemes on a post-facto basis. ADB's approval must be obtained before implementing any subproject that is substituted for a subproject already approved by ADB.

D. Operation and Maintenance

16. On completion of the construction and commissioning phase, the consultants will prepare a completion certificate after verifying that the subproject has been constructed as per agreed-upon scope and specifications, and there are no shortcomings in terms of leakages or water pressure at terminal points. Following the signing of this certificate by the CDWUU and the related project implementation unit and ayil okmotu, and confirmation of the community's satisfaction with the subproject works, the certificate will be issued to the contractor. During project implementation and before handing over of the subproject, the PMU will train CDWUUs on technical and financial operations and provide preventive O&M manuals in the local language and a set of booklets related to budgeting and accounts.

TRIPARTITE AGREEMENT

Memorandum of Understanding (MOU)

between

the Community Drinking Water Users' Union (CDWUU) of (Name of subproject, Oblast),

Ayil Okmotu of ---------- and

the Department of the Rural Water Supply (DRWS)

Kyrgyz Republic

1. This MOU records the agreements of the CDWUU, ayil okmotu, and the DRWS, through its project management unit (the PMU), relating to the CDWUU's subproject proposal for the construction of water supply and sanitation scheme (the subproject) under the Asian Development Bank (ADB)-assisted Community-Based Infrastructure Services Sector Project (the Project).

2. Upon signing the MOU, CDWUU will with the assistance of the PMU (i) is established; and (ii) will open a joint account (the CDWUU account) with the PMU's designated representative in a local bank or post office and make a minimum deposit equivalent to the estimated operation and maintenance costs of the scheme for two months.

3. The CDWUU will

(i) provide the land, including land and water rights, needed for the scheme as per attached MOU for Voluntary Transfer of Ownership of Land for Community Development Works;
(ii) upon the handing over of the scheme after its commissioning by the PMU, manage, operate, and maintain the scheme in the project community to ensure that reliable and economical service is provided to all households that participate in the use of the scheme;
(iii) prior to the award of the scheme by the PMU, make another deposit in the CDWUU account equivalent to the estimated capital cost share as mutually computed and agreed upon by CDWUU and the PMU;
(iv) promote the use of safe human waste disposal facilities in private houses and public institutions in conjunction with improvements to water supplies;
(v) under the guidance of DRWS and ayil okmotu, implement scheme-specific tariffs to recover all operation and maintenance costs for the scheme constructed under the subproject;
(vi) collect and manage the user charges from the project community to pay for the operation and maintenance of the scheme, and maintain accurate and up-to-date financial and maintenance records;
(vii) in consultation with the ayil okmotu, enforce payment of the user charges through appropriate arrangements, including disconnection of house connections of defaulters;
(viii) maintain an accounts receivable arrears ratio to within 90 days or less of the annual water sales for the scheme constructed under the subproject;
(ix) undertake water quality monitoring as per applicable guidelines, and provide results to PMU and ayil okmotu; and
(x) collect information on the subproject performance management system, as per PMU's guidelines, and provide it to the ayil okmotu and PMU.

4. The PMU will

(i) in consultation with the CDWUU and ayil okmotu, plan and design the scheme (including the costing and technical details) before the CDWUU selects the final option including the level of service, in consultation with women groups;
(ii) in consultation with the CDWUU and ayil okmotu, construct a water supply and sanitation scheme that provides a basic level of service for all households and establishments within the service area, in accordance with the drawings and documents with the layout signed by the CDWUU and countersigned by ayil okmotu;
(iii) provide for its capital cost share of the subproject;
(iv) in consultation with the CDWUU and ayil okmotu, adopt appropriate measures during the construction stage of the subproject in mitigating environmental problems (including dust and noise vibration, poorly supported trenches, and disturbances to access and traffic);
(v) provide training and technical support to the CDWUU on operation and maintenance of the scheme, tariff setting and collection, basic accounting and budgeting, water quality monitoring, subproject performance monitoring system, and other planning and management matters;
(vi) in consultation with the CDWUU, develop a preventive maintenance schedule for each rural water supply and sanitation subproject it constructs and furnish this schedule to the CDWUU during the training on the operation and maintenance of the scheme; and
(vii) after the commissioning of the subproject, hand over the subproject to the CDWUU through ayil okmotu for operation and maintenance while retaining responsibility for fixing any defect during the one year maintenance period of the subproject.

5. The PMU and ayil okmotu will hand over the subproject to the CDWUU after its commissioning. PMU, ayil okmotu and the CDWUU will sign a completion certificate indicating the satisfactory construction and commissioning of the scheme. Payment to contractor will be linked to the signing of completion certificate. As built drawings, and operation and maintenance manual for the scheme will be attached to the completion certificate.

6. This MOU shall take effect as from the date of approval of the CDWUU's proposed subproject by DRWS or by ADB, as applicable, under the Project.

For the CDWUU:	For the ayil okmotu:	For the DRWS:
Name of authorized representative	Name of authorized representative	Name of authorized representative
Position in the CDWUU:	Position in the ayil okmotu:	Position in the DRWS:
Date:	Date:	Date:

REVISED FINANCIAL ANALYSIS

1. **Background.** Although financial and economic justifications were found sufficient for the eight community water and sanitation representative subprojects under the Community-Based Infrastructure Services Sector Project,[1] the recent developments affecting prices calls for an updated analysis of new core samples. Three samples subprojects have been chosen from among 38 operational subprojects in Chui *oblast* (province): Archaly, supplied through a spring capture system; Kosnovka, supplied through surface water; and Krasnaya Rechka, supplied through a deep borehole. A review of the operational subprojects under the Project also indicates the need to set up a basis for a revised financial operational plan that will help ensure the sustainability of these subprojects and the potential subprojects undertaken through the supplementary grant.

2. **Comparative Assessment.** The review reveals three specific issues that need to be resolved through an analysis of the core subprojects. These are (i) low collection rates that stall growth, (ii) insufficient tariffs that fail to cover rising operating costs, and (iii) the fact that there have been substantial increases in unit operating and capital investment costs. Based on project management unit (PMU) information as of June 2008, of 38 operational Chui subprojects, 11 (29%) collect less than 20% of expected tariff revenue and four (10%) show collection greater than 70% of the expected tariff revenue. Only 29 reportedly collect enough to recoup operation and maintenance (O&M) costs, with 13 earning some excess to also cover a portion of depreciation or maintenance reserves. Subproject Archaly reports a 51% current tariff revenue collection rate with O&M coverage at only 35%, and subproject Krasnaya Rechka shows a 60% current tariff revenue collection rate with O&M coverage at 58%. Subproject Sosnovka reports a high 102% tariff revenue collection rate, including past year's arrears. Subproject Sosnovka current tariff revenue collection covers only 32% of O&M. The review findings points to the need for an updated analysis of the three sample subprojects following the methodology applied in the project preparation under the Project, and as prescribed by the Asian Development Bank (ADB). The approach to the analysis, revised assumptions, analysis results, and conclusion are discussed in the following sections.

3. **Methodology.** The three core subprojects were analyzed following the *Handbook for the Economic Analysis of Water Supply Projects*[2] and the *Financial Management and Analysis of Projects*.[3] The main financial viability parameters analyzed are (i) the financial internal rate of return (FIRR), with the financial net present value as proxy; and (ii) tariff affordability. Details of the analysis are provided in Supplementary Appendix B.

4. **Assumptions.** The key assumptions used are (i) investment costs at base July 2008 prices; (ii) physical contingencies at 10%; (iii) local inflation at 10% annually and foreign inflation at 2.5% annually; (iv) O&M costs covering salaries, chemicals, power, repair and maintenance, and administration based on estimates by design institutes (domestic engineering firms involved in preparing detailed engineering designs and estimates) for the technology used; (v) asset economic life assumed at 15 years for equipment and 50 years for civil works; (vi) population growth at 1.6% annually; and (vii) foreign exchange at Som36 = $1.

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[1] ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project. Manila.*

[2] ADB. 1999. *Handbook for the Economic Analysis of Water Supply Projects.* Manila.

[3] ADB. 2005. *Financial Management and Analysis of Projects.* Manila.

5. **Cost Estimates.** The investment cost has three major components: (i) physical infrastructure, consisting of civil works, materials and equipment, and development costs including design engineering and construction supervision and taxes and duties; (ii) capacity building, including institutional strengthening, hygiene and sanitation education, and consulting services; and (iii) project management support. The three subprojects require an investment of Som21.14 million ($0.59 million), including contingencies. The capital costs for the three subprojects are summarized in Table A13.1.

Table A13.1: Subproject Capital Cost

in Som '000

Component	Total	Archaly	Sosnovka	Krasnaya R
A. Base Cost [a]	-			
1. Part A: Water Supply and Sanitation Infrastructure	13,867	1,719	4,379	7,769
2. Part B: Institutional Development	1,632	202	515	914
3. Part C: Project Management and Administration	1,360	169	429	762
Subtotal (A)	16,859	2,090	5,324	9,446
B. Contingencies				
1. Physical Contingency	1,686	209	532	945
2. Price Contingency	1,855	230	586	1,039
Subtotal (B)	3,540	439	1,118	1,984
C. Financing Charges during Implementation	737	91	233	413
Total Landed Cost (A+B+C)	21,137	2,620	6,674	11,842

[a] In mid-2008 prices. Includes taxes and duties.

Source: Project Management Unit estimates.

6. **Financing Plan.** The investment will be financed through a mix of ADB grant, estimated at $30 million or 80% of total capital investment, and Government contribution of $7.5 million. For the core subprojects, the Government will contribute Som4.23 million ($0.12) million and ADB will provide Som16.91 million ($0.47 million) including interest during construction. The summary financing plan for the core subprojects is given in Table A13.2.

Table A13.2: Subproject Financing Plan

in Som '000

Component	%Total	Total	Archaly	Sosnovka	Krasnaya R
Amount to be financed:					
Investment in Project		21,137	2,620	6,674	11,842
Other		-	-	-	-
Total Capital Investment		21,137	2,620	6,674	11,842
Financed by:					
Asian Development Bank	80	16,909	2,096	5,339	9,474
Disbursement		16,172	2,005	5,107	9,061
IDC		737	91	233	413
Government	15	3,170	393	1,001	1,776
Community Contribution	5	1,057	131	334	592
Total financed	100	21,137	2,620	6,674	11,842

Source: Project Management Unit estimates.

7. **Operational Expenditure.** Subproject O&M costs include community drinking water users' union (CDWUU) staff salaries, power, chemical treatment, administration, and repairs and maintenance, and are based on PMU data on actual sample operations. Depreciation is assumed at 2% annually for civil works (calculated on a 50-year economic life of components) and 6.7% for materials and equipment (calculated on a 15-year economic life). Replacement of fully depreciated assets is provided for and assumed to be financed either through net operating

income (when financially feasible) or by Government, to keep future tariffs within affordable levels.

8. **Service Delivery Assumptions.** The analysis is based on the design demand of about 70 liters per capita day (lpcd) for yard connection and 40 lpcd for public standpost users. Watering livestock is provided for in demand measurement, and is assumed to be 10% of total demand for yard and public standpost demand. Lower income households and those remote to the piped distribution are assumed to resort to public standposts for their water needs. About 50% of households are assumed to tap piped distribution. The demand forecast assumes all water from existing alternative sources will be replaced with subproject water supply. This has featured as nonincremental water in the economic analysis.

9. **Cost Recovery Analysis.** The tariff is established by dividing all cash requirements by the volume of water sold. It was assumed that the collection rate would improve as service improves. In the analysis, from actual collection rates of below 70% for Archaly and Krasnaya Rechka and about 80% for Sosnovka, collection rates would reach 95% by year 5. The analysis determines the level of tariffs required to satisfy the cost recovery options to include: (i) full O&M cost coverage; (ii) O&M cost plus depreciation; (iii) O&M plus debt payments; and (iv) breakeven, i.e., O&M plus depreciation and debt payments. The required subsidy levels have been assessed where tariffs are insufficient to attain full cost recovery.

10. **Tariff Basis and Forecast.** The tariffs follow current practice that differentiates tariffs for yard connections and public standposts. For yard connections, the tariffs are volume-based and structured to prevent wastage. Yard connections are charged three times more than public standposts. This allows the poor within the community who have lower disposable income to be able to at least cover their basic water needs. The higher-income households, generally requiring more water and consequently incurring higher marginal costs, are made to pay more. Livestock water consumption is attached to tariff estimation for public standposts. In the financial projections, where costs are given in nominal terms, the tariffs are projected to increase biannually to cope with cost inflation. In the FIRR cash flows, the tariffs are given in real terms.

11. **Weighted Average Cost of Capital.** The WACC is calculated in real terms and used as the hurdle rate for FIRR to measure subproject viability. Funding sources are the ADB grant (80%) and Government contribution (20%). Inflation is estimated at 2.5% for foreign costs and 10% for local costs. The rates are computed on an after-tax basis, resulting in the WACC in real terms being estimated at 3.0%. The WACC calculation for the three sample subprojects combined is presented in Table A13.3.

Table A13.3: Weighted Average Cost of Capital

in Com '000

Particulars	Capital	% Total	%Cost of Capital	Weighted Capital	WACC Nominal %	Inflation rate %	WACC Real %
ADB	16,909	80.0	1.5	254	1.5	2.5	0.00
Government	4,227	20.0	13.3	562	13.3	10.0	3.00
Total Capital Investment	21,137	100.0		816			3.00

WACC = weighted average cost of capital
Source: Project Management Unit estimates.

12. **Affordability Analysis.** Affordability analysis was undertaken to check the level of water expenditure against average household income. Table A13.4 presents the affordability levels in each subproject for year 1 (2009), year 5 (2013), and year 15 (2023). The number of persons per household and the unit consumption are based on field survey. The average household incomes are from the social survey conducted in Chui oblast under the project preparation and have been escalated to account for inflation. Based on the tariff increases required to satisfy viability parameters, water expenditure will eventually overtake average income, and thus tariffs will exceed consumer affordability. To keep tariffs at affordable levels, subsidy infusions during specific periods when tariffs are relatively high will need to be considered. Table A13.4 indicates that the monthly charges under yard connections for Archaly and Krasnaya Rechka exceed the generally accepted limit of 5% of household income in all specified periods. Likewise, the charges for public standpost usage in Krasnaya Rechka substantially exceed the 5% of household income limit. Water expenditure under both service types for Sosnovka are within acceptable limits. The main factors are Sosnovka's large customer base relative to the system type, which is also cheaper to operate. In future, selection of subprojects for inclusion under the Project would give due consideration to such technical factors.

Table A13.4: Tariff Affordability

Particulars	Subproject Archaly			Subproject Sosnovka			Subproject Krasnaya Rechka		
	Year 1	Year 5	Year 15	Year 1	Year 5	Year 15	Year 1	Year 5	Year 15
Persons per household	5.6	5.6	5.6	3.8	3.8	3.8	4.7	4.7	4.7
Consumption, lpcd									
Yard connection	70	70	70	73	73	73	67	67	67
Public standpipe	47	47	47	47	47	47	41	41	41
Average monthly consumption, m^3									
Yard connection	12	12	12	8	8	8	9	9	9
Public standpipe	8	8	8	5	5	5	6	6	6
Household income/mo, Som	1,650	2,318	3,934	1,650	2,318	3,934	1,650	2,318	3,934
Monthly charge, Som	180	286	910	44	77	322	187	283	796
Yard connection, Som/month	129	205	651	30	54	223	128	194	546
Public standpipe, Som/month	58	92	292	30	52	218	271	410	1,155
Income spent for water (%)	11	12	23	3	3	8	11	12	20
Yard connection (%)	8	9	17	2	2	6	8	8	14
Public standpipe (%)	4	4	7	2	2	6	16	18	29

Source: Asian Development Bank estimates.

13. **Financial Viability Approach.** The subproject is considered viable if the resulting FIRR is greater than the WACC, and the tariff applied to recover cost is affordable to the consumer. The affordability analysis shows that for subprojects Archaly and Krasnaya Rechka, the projected tariffs required for the FIRR to exceed the WACC would go beyond consumer affordability. Thus, to satisfy both viability parameters, tariffs will need to be subsidized. To measure the subsidy requirements, tariffs have been set at different cost-recovery options that would result in (i) the FIRR exceeding the WACC; (ii) maximum affordability, i.e., within the generally accepted 5% of household income; (iii) full O&M cost recovery; (iv) full O&M plus depreciation; (v) full O&M plus debt servicing; and (vi) full O&M plus depreciation and debt servicing (the break-even level). Table A13.5 presents the tariffs for these options and the subsidies needed to attain financial sustainability. Based on the analysis, all cost recovery options will require a certain level of tariff subsidization for the subproject to attain viability. Detailed analysis is provided in Supplementary Appendix B and is summarized below:

(i) If tariffs are set so that the FIRR exceeds the WACC, Archaly and Krasnaya Rechka will require annual subsidies until year 4, while Sosnovka will require subsidies until year 5.

(ii) Archaly and Krasnaya Rechka need annual subsidies until year 32 if tariffs are set at maximum affordability. Sosnovka would require subsidies until year 4.

(iii) If tariffs are set to attain breakeven, some subsidization will still be required until year 5 for all subprojects.

14. **Sensitivity Analysis.** Sensitivity tests were performed to determine the effects of (i) a 20% increase in investment cost, (ii) a 20% increase in O&M cost, (iii) a 20% decrease in revenue, and (iv) a 1-year delay in project revenue generation. In all sensitivity scenarios, the FIRR for the three subprojects surpasses the WACC. All the subprojects remain robust under adverse circumstances. Table A13.5 presents the results of the FIRR calculations and the sensitivity analysis.

Table A13.5: Subproject Financial Internal Rate of Return
(%)

Subproject	Base Case	Capital + 20%	O&M + 20%	Benefit -20%	1-yr Delay in Benefit	Switching Value		
						Costs	Benefits	Capital [a]
Archaly	9.4	8.0	5.7	3.6	7.0	27.0	22.0	134.2
Sosnovka	7.5	6.0	5.7	3.6	5.9	28.6	23.3	73.9
Krasnaya Rechka	8.1	6.5	5.7	3.4	6.2	26.4	21.5	77.7

[a] At this level of capital cost increase, FIRR will be equal to weighted average cost of capital at 3%.

Source: Asian Development Bank estimates.

15. **Financial Viability Analysis.** The three core subprojects are found to be financially viable, but will require operational subsidies to attain full cost recovery (O&M, debt, and depreciation). At tariffs set for the FIRR to exceed the WACC, the FIRR for subproject Archaly is 9.4%, for subproject Sosnovka it is 7.5%, and for subproject Krasnaya Rechka it is 8.1%. Tariff increases every 2 years are required to attain a level of self-sufficiency. However, to attain financial viability throughout the study period, subsidies are required to soften the burden on the users of both yard connections and public standposts. To minimize operational subsidy needs, tariffs may be further increased by larger increments and more frequently. However, consumer affordability may be compromised, especially as the current tariffs are already beyond the generally accepted 5% limit.

16. **Conclusion.** The analysis of the three core samples have been updated in consideration of the substantial cost hikes that were unforeseen during the initial project preparation stage. Analysis findings indicate that the sample subprojects are financially viable on two measures: (i) required periodic tariff increases (herewith assumed every 2 years), and (ii) tariff subsidization based on cost recovery with regard to consumer affordability. For these measures to be relevant to the succeeding subprojects under the supplementary grant, they would be incorporated when preparing subproject financial operational plans. These plans and related issues have been discussed and agreed with the Department of Rural Water Supply for achieving financial sustainability of the overall investment. Issues pertaining to subsidization, the manner of implementation, and funds sourcing are specifically relevant. Income affordability is a major factor in determining subsidy requirement, and thus household income bases may need to be reviewed periodically.

REVISED ECONOMIC ANALYSIS

1. **Objectives.** Under the initial project appraisal for the Community-Based Infrastructure Services Sector Project,[1] economic and financial analyses were carried out for eight representative rural subprojects for the water supply component, with resulting indicators showing all subprojects to be viable with economic internal rates of return (EIRRs) ranging between 13% and 38.2%, averaging 28.5%, and average financial internal rates of return (FIRRs) ranging between 4.7% and 14.4%, and averaging 11%. Of 240 subprojects planned, only 118 have been undertaken, of which 85 are reportedly completed as of the end of 2007. The proposed supplementary grant will finance the completion of unfinished works and the remaining subprojects. The following discussions present the economic viability analysis of three operational subprojects chosen to represent the completed subprojects under the initial Project and those included under the proposed supplementary grant. This would ensure that operation and maintenance (O&M) of the existing and completed subprojects and the new assets under the supplementary grant reflecting both the costs of construction delays and the rise in component prices can be adequately covered. As there is no variation in project scope and benefits level, the revised economic and financial analyses follow through from the original appraisal approach, except for the benefit–cost analysis that requires revisiting. Similar to the revised financial analysis, three core subprojects from Chui *oblast* (province) were considered to represent the range of supply sources, population coverage, and system O&M within the four oblasts under the supplementary grant (Appendix 13).

2. **Methodology.** The economic analysis follows Asian Development Bank (ADB) guidelines, including the *Guidelines for the Economic Analysis of Projects*[2] and the *Handbook for the Economic Analysis of Water Supply Projects*.[3] The analysis describes the economic rationale and target beneficiaries and undertakes a viability analysis of the core subprojects. Based on sector review, demand analysis, and subproject beneficiary assessment, the economic benefit–cost and sensitivity analyses were carried out. The analysis compares the calculated EIRR with the economic opportunity cost of capital (EOCC), assumed to be 12%. With the EIRR greater than the EOCC, the subproject proposal is deemed economically feasible. A sensitivity analysis was conducted to see the effects of certain adverse conditions on system capital investment and O&M cost, revenue generation, and overall subproject viability. The analysis uses the domestic price numeraire, as benefits are nontradable in nature. The analysis was undertaken at constant June 2008 price levels and assesses the project effects over a 25-year period.

3. **Economic Rationale and Goals.** The project rationale results from the increasing concern over the worsening water supply situation in the rural communities as a result of implementation delays in ongoing interventions. Without urgent investments to pursue the long-term objective of providing sufficient and secure water supply in the selected regions, the negative impacts on the health of the poor and their economic condition would only tend to nullify any efforts already undertaken. The Project is considered a high priority by the Government and is well-integrated with other investment activities in the four regions covered under the supplementary grant.

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[1] ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project.* Manila.

[2] ADB. 1997. *Guidelines for the Economic Analysis of Projects.* Manila.

[3] ADB. 1999. *Handbook for the Economic Analysis of Water Supply Projects.* Manila.

4. **Selection Approach.** The subprojects were selected based on the design and selection criteria for rural communities detailed in volume I of the main report prepared under TA 3048-KGZ.[4] The selection process required (i) consistency with demand based on community willingness to participate and contribute; (ii) the least-cost approach of meeting effective demand in terms of location, scale, and appropriate technology; and (iii) that economic benefits were likely to exceed economic costs. Preference is also given to communities with high water-related health risks and multiple communities served by single integrated systems.

5. **Project Components.** The project focuses on the secure and sustainable supply of good quality potable water to rural communities within the four regions. The physical works comprise source development for individual and integrated supply systems, to include boreholes, spring captures, and surface water structures. The physical plant consists of trunk mains, pumping stations, reservoirs, and treatment facilities. The local distribution networks will include metered yard connections and public standpipes. The Project will also provide technical assistance and capacity building and sanitation and health awareness education.

6. **Economic Costs.** The economic capital investment and annual O&M costs were calculated from the financial cost estimates given in Appendix 13. Taxes and duties are excluded from the financial costs as they represent transfer payments. Price inflation and market distortions are also excluded. The subproject capital and O&M costs are distributed into traded and nontraded components and labor. For traded and nontraded components, the shadow exchange rate factor is assumed at 1.0 based on rural projects undertaken by ADB and the World Bank in the Kyrgyz Republic. Unskilled labor is available in the rural economy which means the opportunity cost is lower than the wage rate. The shadow wage rate is assumed to be 0.7 for unskilled labor following estimates made for agricultural and highway projects in the Kyrgyz Republic. The economic costs are given in real terms and phased over the project design period at 15 years. The cost streams are assessed over 25 years. Table A14.1 presents the calculation of the economic project costs for the three core subprojects.

[4] ADB. 1998. *Technical Assistance to the Kyrgyz Republic for the Community-Based Infrastructure Services Sector Project.* Manila.

Table A14.1: Conversion of Financial to Economic Project Cost

(Som '000)

Subproject Archaly

Particulars	Financial Cost Total	Foreign Cost	Local Cost	Unskilled Labor 30%	Balance Local Cost	Taxes	Other	Foreign x SERF 1.00	Unskilled x SWRF 0.70	Other x SCF 0.01	Economic Project Cost
Civil Works	660	271	390	117	273	101	171	271	82	171	524
Equipment	1,036	425	611	-	611	250	362	425	-	362	786
Total CW and Equipment	1,696	695	1,001	117	884	351	533	695	82	533	1,310
Design and construction supervision	85	-	85	-	85	-	85	-	-	85	85
Institutional development	210	14	196	-	196	-	196	14	-	196	210
Project management and administration	175	123	52	-	52	-	52	123	-	52	175
Physical Contingency	217	89	128	-	128	-	128	89	-	128	217
Total Construction Cost	2,382	921	1,461	117	1,344	351	993	921	82	993	1,996

Subproject Sosnovka

Particulars	Financial Cost Total	Foreign Cost	Local Cost	Unskilled Labor 30%	Balance Local Cost	Taxes	Other	Foreign x SERF 1.00	Unskilled x SWRF 0.70	Other x SCF 0.01	Economic Project Cost
Civil Works	1,682	690	992	298	695	258	437	690	208	437	1,335
Equipment	2,639	1,082	1,557	-	1,557	636	921	1,082	-	921	2,003
Total CW and Equipment	4,321	1,772	2,549	298	2,252	894	1,358	1,772	208	1,358	3,338
Design and construction supervision	216	-	216	-	216	-	216	-	-	216	216
Institutional development	534	36	498	-	498	-	498	36	-	498	534
Project management and administration	445	313	132	-	132	-	132	313	-	132	445
Physical Contingency	552	226	325	-	325	-	325	226	-	325	552
Total Construction Cost	6,068	2,346	3,721	298	3,423	894	2,529	2,346	208	2,529	5,084

Subproject Krasnaya Rechka

Particulars	Financial Cost Total	Foreign Cost	Local Cost	Unskilled Labor 30%	Balance Local Cost	Taxes	Other	Foreign x SERF 1.00	Unskilled x SWRF 0.70	Other x SCF 0.01	Economic Project Cost
Civil Works	2,984	1,224	1,761	528	1,232	458	775	1,224	370	775	2,368
Equipment	4,683	1,920	2,763	-	2,763	1,128	1,634	1,920	-	1,634	3,554
Total CW and Equipment	7,667	3,143	4,523	528	3,995	1,586	2,409	3,143	370	2,409	5,922
Design and construction supervision	383	-	383	-	383	-	383	-	-	383	383
Institutional development	947	63	884	-	884	-	884	63	-	884	947
Project management and administration	789	556	234	-	234	-	234	556	-	234	789
Physical Contingency	979	401	577	-	577	-	577	401	-	577	979
Total Construction Cost	10,766	4,163	6,602	528	6,074	1,586	4,488	4,163	370	4,488	9,021

CW = civil works; SCF = standard conversion factor; SERF = shadow exchange rate factor; SWRF = shadow wage rate factor.
Source: Asian Development Bank estimates.

7. Table A14.2 shows the projected annual economic O&M costs for the subprojects. Labor is assumed at 30% skilled and the rest unskilled. Unskilled labor is subject to a shadow wage rate of 0.7. For skilled labor and the other cost components, a shadow exchange rate factor of 1.0 is applied.

Table A14.2: Economic Operation and Maintenance Costs

(Som '000)

Subproject Archaly

O&M Components	Conversion factor	Year 1		Year 5		Year 10		Year 15	
		Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Labor salaries									
Skilled	1.0	171	171	205	205	222	222	240	240
Non-skilled	0.7	73	51	88	61	95	66	103	72
Power	1.0	3	3	4	4	5	5	5	5
Chemicals	1.0	9	9	11	11	12	12	13	13
Maintenance	1.0	252	252	303	303	328	328	355	355
Other	1.0	-	-	-	-	-	-	-	-
Total O&M expenses		509	487	610	584	661	632	715	685

Subproject Sosnovka

O&M Components	Conversion factor	Year 1		Year 5		Year 10		Year 15	
		Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Labor salaries									
Skilled	1.0	97	97	104	104	112	112	122	122
Non-skilled	0.7	42	29	45	31	48	34	52	37
Power	1.0	6	6	6	6	7	7	7	7
Chemicals	1.0	23	23	24	24	26	26	29	29
Maintenance	1.0	417	417	444	444	481	481	520	520
Other	1.0	-	-	-	-	-	-	-	-
Total O&M expenses		584	572	623	609	674	660	730	714

Subproject Krasnaya Rechka

O&M Components	Conversion factor	Year 1		Year 5		Year 10		Year 15	
		Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
Labor salaries									
Skilled	1.0	288	288	307	307	332	332	360	360
Non-skilled	0.7	123	86	132	92	142	100	154	108
Power	1.0	225	225	240	240	260	260	281	281
Chemicals	1.0	5	5	5	5	5	5	6	6
Maintenance	1.0	603	603	642	642	695	695	753	753
Other	1.0	-	-	-	-	-	-	-	-
Total O&M expenses		1,244	1,207	1,326	1,286	1,435	1,392	1,554	1,508

O&M = operation and maintenance.

Source: Asian Development Bank estimates.

8. **Water Supply Situation.** Prior to and without the Project, the village communities in the subprojects relied on water vendors, trucked service, distant irrigation canals, springs, and rivers as their main water sources. With the Project, piped water will replace all supplies from these sources that now comprise nonincremental demand. The water system in Archaly supplies about 80% of the population; in Sosnovka and Krasnaya Rechka the systems supply about 90%. The supply situation is projected to rise with population growth at 1.6%, and increase annually to reach the design target population served of 90% by year 5. Current demand averages 70 liters per capita per day (lpcd) for yard connections and 40 lpcd for public standposts. Demand is based on actual survey and assumed to remain at the same level with the Project in place. In Chui *oblast* (province), where all three subprojects are located, households without yard connections spend about an hour daily covering a distance of 500–1,000 meters to collect water from unsafe rivers or open irrigation canals. Poor maintenance of the existing piped and nonpiped systems (with effects seen more with the latter type[5]) due to lack of operational funds resulting from inadequate tariffs and low collection rates, has also led yard connection users to supplement their current needs in the same manner, with some

[5] This was one of the reasons cited in the social survey why, even in the rural communities in most regions where piped systems exist, preference for yard connection is high. In Archaly, 86% opt for direct yard connections. In Sosnovka and Krasnaya Rechka, yard connection is even higher (96% in Sosnovka and 98% in Krasnaya Rechka).

reverting to more expensive supplies from trucks and vendors. With available supplies mitigated through the financial operational plans outlined in the financial analysis (Appendix 13), current demand levels will be met. However, in more developed subproject communities, there are consumers who exceed design demand levels and have the capacity and are willing to pay for the excess. This induced demand arises with the lower price offered with the piped service. The situation leads to the depletion of supply sources earlier (by about 5 years) than the projected design horizon of 15 years. In this instance, sufficient funds will have been generated from the improved financial operational plans to finance development of additional supply sources to augment increased demand.[6] Table A14.3 presents the current and future demand situation in the three samples subprojects. For purposes of the analysis, year 0 is taken as the without-project scenario, for although the systems are partially operational, any reported improvements to the system and service prior to project interventions remain insignificant. Year 1 represents the first year of full or improved system operation, when all facilities, including financial operational plans, are in place.

9. **Subproject Beneficiaries.** Subproject beneficiaries comprise households with existing connections and those that are yet to receive direct house or yard connections but who previously obtained water from public standposts or other sources. The beneficiaries also include households that will continue to depend on public standposts as the main supply source for economic and technical reasons. In Archaly, the number of beneficiaries is seen to increase by 63% by year 5 from the without-project situation; in Kosnovka and Krasnaya Rechka, beneficiaries will increase by 43% in the same period. The total beneficiaries in the sample subprojects will reach 14,000 (90% of the total population) by year 15.

Table A14.3: Current and Projected Demand

	Subproject Archaly				Subproject Sosnovka				Subproject Krasnaya Rechka			
Particulars	Year 0	Year 1	Year 5	Year 15	Year 0	Year 1	Year 5	Year 15	Year 0	Year 1	Year 5	Year 15
Population	1,938	1,969	2,098	2,458	5,420	5,507	5,868	6,878	4,724	4,800	5,115	5,994
% served population	70	80	90	90	80	90	90	90	80	90	90	90
Served population	1,356	1,575	1,888	2,213	4,336	4,956	5,281	6,190	3,780	4,320	4,603	5,395
% served - yard connection	86	86	86	86	96	96	96	96	98	98	98	98
% served - public standpost	14	14	14	14	4	4	4	4	2	2	2	2
Lpcd - yard connection	70	70	70	70	73	73	73	73	67	67	67	67
Lpcd - public standpost	47	47	47	47	47	47	47	47	41	41	41	41
Lpcd - livestock, % yard + ps lpcd	10	10	10	10	10	10	10	10	10	10	10	10
Annual production, m3 '000	36	42	51	59	126	144	153	180	101	115	123	144
UFW, % production	10	10	10	10	10	10	10	10	10	10	10	10
Volume sold, m3 '000	33	37	45	54	113	130	139	162	91	104	111	130
Yard connection	27	31	37	44	100	115	122	143	82	94	100	117
Public standpost	3	3	4	5	3	3	4	4	1	1	1	1
Livestock	3	3	4	5	10	12	13	15	8	9	10	12
Technical loss, % production	100	100	100	1 00	100	100	100	100	100	100	100	100
Non-technical loss, m3 '000	0	0	0	0	0	0	0	0	0	0	0	0
Incremental water, % volume sold	15	15	15	15	20	20	20	20	15	15	15	15
Non-incremental water, % volume sold	85	85	85	85	80	80	80	80	85	85	85	85
Persons per household (PPH)	6	6	6	6	4	4	4	4	5	5	5	5
Number of households	243	282	338	396	1,148	1,312	1,398	1,638	813	929	990	1,160

lpcd = liter per capita per day, PPH = persons per household, UFW = unaccounted-for water.
Source: Asian Development Bank estimates.

10. **Economic Benefits.** The main benefits would arise from resource cost savings from incremental water demand that arise from existing levels of piped consumption and replaced

[6] In this manner, additional costs arising from financing new development will be cancelled out by the benefits resulting from user willingness to pay for higher consumption.

supplies from other sources. The with-project and without-project scenarios were evaluated to determine the benefits effects.

(i) The project benefits were quantified based on collection time and cost savings for nonincremental water supply. The cost of time used for collecting water is estimated at 50% of the average hourly wage rate in the area and using average distance and collection time. This was multiplied by the shadow wage rate of 0.7, and the number of hours spent annually on water collection. To this, the cost of in-house storage and treatment was added. These benefits account for the costs that households would have incurred in a without-project situation. The total cost to the household was then divided by the total water consumption to arrive at the nonincremental benefit per unit consumption. Existing supplemental supplies through water vendors, trucked service, etc., will be replaced by the new piped system and also form part of nonincremental inputs.

(ii) Induced demand would comprise incremental benefits, which were valued using the average of the willingness to pay (WTP) based on the contingent valuation method applied in the 1999 social survey conducted in the regions, and the long-run marginal cost proxied by the average incremental economic cost in the analysis.[7] The incremental benefits that accrue from induced demand, estimated at 15%–20% of total projected demand, is due to lower costs associated with piped service with the project.

(iii) There are no benefits assumed from nontechnical loss, e.g., pilferage, meter tampering, and illegal connections, as the systems are small and easily monitored.

11. **Economic Benefit–Cost Analysis.** The benefit–cost ratio (BCR) is utilized in the analysis to assess whether project benefits outweigh costs, thus making the Project economically feasible. The main economic costs evaluated in the analysis comprise capital investment and O&M costs. The major economic benefits include nonincremental water assessed using resource cost savings approach. The annual cost streams are set against the annual benefit streams and discounted using the EOCC at 12% as the hurdle rate. The resulting present value of benefits is divided by the present value of costs and, if the resulting ratio is greater than or equal to 1.0, the project is deemed acceptable. Table A14.4 summarizes the results for the three samples, all of which show BCRs above 1.0.

Table A14.4: Benefit–Cost Analysis
(Som '000)

Subproject	Archaly	Sosnovka	Krasnaya R
Present Value of Benefits			
Incremental	618	1,905	1,940
Non-incremental	6,168	12,950	21,826
Total	6,786	14,854	23,765
Present Value of Costs			
Capital	1,910	4,866	8,634
O&M	3,054	4,116	7,974
Total	4,964	8,983	16,608
Benefit–Cost Ratio	1.37	1.65	1.43

O&M = operation and maintenance.
Source: Asian Development Bank estimates.

[7] Induced demand is expected with the lower price of piped water from the new system relative to the existing price of delivered water at Com15–Com25/cubic meter (m^3). Comparatively, average incremental economic cost for Archaly is Com13.21/ m^3, for Sosnovka Com7.69/ m^3, and for Krasnaya Rechka Com17.74/m^3. Noted also was the dissatisfaction of villagers who do not receive delivery on time or at regular intervals, and with water always at risk of contamination. Collected water from distant sources was not deemed completely safe to drink.

12. The BCR is a stronger indicator of the variance in the economic viability of the subprojects under the supplementary grant in comparison to those under the initial Project. For similar schemes (spring, surface, and borehole water sources), the BCR for subprojects in the initial Project ranged from 3.27 to 4.72; the BCR for subprojects under the supplementary grant ranged from 1.37 to 1.65. The economic costs have obviously increased over time with the benefits remaining the same. Considering that the BCR in all sample subprojects remains greater than unity, the subprojects are economically viable.

13. **Economic Internal Rate of Return.** The benefits streams from resource cost savings are compared with the cost streams of capital and O&M costs to determine the discounted net cash flows and the resulting EIRR for each core subproject. Following ADB guidelines, the EOCC is set at 12%. The results show all EIRRs exceeding the EOCC. The average EIRR is 29.7%. For the individual subprojects, the EIRR ranges between 26.6% and 33.9%. Table A14.5 indicates EIRRs at base and under stress conditions.

Table A14.5: Economic Analysis Summary Results (%)

	Base	Capital +	O&M +	Benefit	1-yr Delay	Switching Value		
Subproject	Case	20%	20%	-20%	in Benefit	Costs	Benefits	Capital [a]
Archaly	28.5	22.8	22.9	16.2	18.6	32.0	26.7	94.8
Sosnovka	33.9	26.8	30.5	22.4	23.0	45.4	38.2	119.9
Krasnaya Rechka	26.6	21.2	23.3	16.8	18.8	35.7	29.9	82.3

[a] At this level of capital cost increase, EIRR will be equal to EOCC at 12%.

EIRR = economic internal rate of return, EOCC = economic opportunity cost of capital, O&M = operation and maintenance.
Source: Asian Development Bank estimates.

14. EIRRs are tested for sensitivity using the following parameters: (i) a 20% increase in capital cost, (ii) a 20% increase in O&M cost, (iii) a 20% reduction in benefits, and (iv) a 1-year delay in benefits. Likewise, switching values are applied to the costs and benefits parameters. The schemes are found to be generally robust and insensitive to changes in capital cost, and less so to changes in O&M cost. A decrease in benefits would affect Archaly marginally, but the rest of the subprojects will remain robust. A 1-year delay in benefits would have only slight effects. The switching values represent the change in costs and benefits that sets the EIRR at 12%. The results show the subprojects can absorb changes in costs of between 29% and 39% and remain economically viable. Decreases in benefits of between 24% and 33% are also manageable. On a constraint situation, to determine the maximum capital costs, the analysis indicated that the subproject capital cost may increase by as much as 82%–120% with EIRR still equal to EOCC.

15. **Conclusion.** The economic analysis indicates that the subprojects are economically viable with EIRR values exceeding the EOCC in all cases. It should be noted that this analysis excludes the significant health and environmental benefits from these quantified results. The sensitivity analysis demonstrates the results to be robust even when tested under unfavorable economic conditions. The resulting BCRs for the subproject range between 1.4 and 1.71, also indicating feasibility.