

Project Name Uzbekistan-Water Supply, Sanitation (@+)...
and Health Project

Region Europe and Central Asia

Sector Infrastructure

Project ID UZPA9121

Borrower Republic of Uzbekistan

Implementing Agency Goskomprognostat

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Country and Sector Background

1 The Republic of Uzbekistan is a semi-arid country on the steppes of Asia that borders on the four other ex-Soviet Central Asian republics along with Afghanistan. It is a country the size of California with a population of 23 million. Uzbekistan once had large-scale heavy industry, but today agriculture is the dominant economic activity. Only 10 percent of the land is cultivated, yet Uzbekistan is still the world's third largest exporter of cotton. Agriculture in Uzbekistan depends almost entirely on irrigation. The Amu Darya and Syr Darya river systems provide 95 percent of the water for irrigation.

2 In 1954 with the completion of the 1,300-km Kara Kum canal system, the Amu Darya and Syr Darya rivers were diverted for agriculture. From 1954 to 1985 almost no water flowed into the Aral Sea from its two major tributaries. Diverting the two rivers accelerated the decline of the Aral Sea. Thirty-five years ago, the Aral Sea was the world's fourth largest inland body of water. It had a fishing industry that employed 60,000 people and a thriving tourist trade. Today the Aral Sea is biologically dead and has shrunk by approximately 70 percent in volume and 50 percent in area. Fishing towns such as Muynak are now 60 kilometers inland. In 1995 an estimated three million hectares of desiccated seabed surrounded the Aral Sea. Up to 70 million tons per year of salt from the exposed seabed are blown over thousands of kilometers of inhabited land.

3 By the mid 1960s, potable water quality and quantity in the Aral Sea area had decreased to such an extent that alternative water sources were needed. A dam was built about 400 km upstream from the Aral Sea where the Amu Darya river flows through Turkmenistan. The dam (Tuyamuyun) serves as a hydroelectric power plant and has a reservoir of 2,340 million cubic meters which provides water for irrigation and drinking. Two treatment plants filter and chlorinate the water prior to pumping it to the principal towns in the Uzbekistan Aral Sea basin. Pumping costs are high (about 55 percent of total costs) given the long distance, the

lack of intermediate pumping stations, and the 310m increase in altitude. About 85 percent of the potable water for the project area comes from the Tuyamuyun reservoir.

4 Since independence in 1991, Uzbekistan has suffered less than 20 percent cumulative drop in GDP, but fiscal revenues have dropped faster along with public expenditures. Spending from the state budget declined from about half of GDP in 1990-93 to one-third of GDP in 1996, with a drastic effect on services such as the provision of potable water. The shortages of funds led to inadequate maintenance and a lack of essential operating supplies such as chlorine. Availability of water is limited to several hours a day in many areas. In the larger distribution networks, system pressures are roughly half the optimal pressure. The distribution systems in the urban areas are old and corroded. Even at half pressure, the major region of the project area had an average 6.1 breaks per km in 1995.

5 There are approximately 2.2 million inhabitants in the project area of which about 59 percent have access to piped water systems. In rural areas, the most common form of water supply is the hand pump, but both coverage and quality are inadequate. A recent Social Assessment Study found that an average of 59 people share a single hand pump. The ground water in many areas is high in salt. Several hundred rural areas have their own water desalinization units but an increasing lack of spare parts and training have hampered their utility.

6 In 1991 the infant mortality rate for all of Uzbekistan was 44 deaths per 1,000 births. In the Uzbek area of the Aral Sea basin, the infant mortality rate was 51 in the same year. For comparison, Russian has an infant mortality rate of 20, and Germany, France and the United States all have infant mortality rates of less than 10. The maternal mortality rates in the Aral Sea area are roughly double those in the rest of Uzbekistan. Respiratory ailments, hepatitis and acute intestinal diseases are all prevalent in the project area.

7 In June 1994 an international donors' conference in Paris agreed to support a program to address the most pressing problems in the Aral Sea basin: potable water, basic sanitation, and improved health care. The Central Asian Republics of Uzbekistan, Turkmenistan, Kazakstan, Kyrgyz Republic, and Tajikistan formed the Aral Sea Program. The Program was designed in cooperation with the United Nations Development Program, the United Nations Environmental Program, and the World Bank to improve environmental, social and economic conditions in the region. At the Paris conference, it was decided that the World Bank would take the lead role in preparing a project focusing on the two regions of Uzbekistan most severely affected by the Aral Sea crisis: the Republic of Karakalpakstan (a sovereign republic within Uzbekistan bordering on the Aral Sea) and the Khorezm Oblast (a province in Uzbekistan to the south of the Aral Sea).

8 To facilitate the development of the proposed project and to

identify the most urgent needs, a Pilot Water Supply Engineering Project was approved in September 1996 (Ln. 4090-UZ). The objectives of the Pilot Project are to generate the data and engineering designs needed for the preparation of the larger proposed project. The Pilot Project takes a "learning-by-doing" approach and is testing various measures and components on a small scale to determine the most effective means of addressing the water, sanitation and health problems and the most efficient implementation arrangements.

9 The water sector in the proposed project area of Karakalpakstan and Khorezm Oblast is organized around two bulk water providers, Tuyamuyan-Nukus and Tuyamuyan-Urgench. They supply approximately 85 percent of the potable water for the project area via four distribution companies. Two agencies (Vodokanals) distribute water to the urban areas of Karakalpakstan and Khorezm Oblast. Two separate agencies (Agrovodokanals) distribute water to the rural areas of Karakalpakstan and Khorezm Oblast. The two bulk water providers come under the purview of the Uzbek Ministry of Communal Services. Urban water distribution in Karakalpakstan is the responsibility of the Republic's Ministry of Communal Services, and rural water distribution is the responsibility of the Republic's Ministry of Agriculture. In Khorezm Oblast, urban distribution is supervised by provincial authorities in cooperation with the Uzbek Ministry of Communal Services. Rural distribution is also supervised by provincial authorities but in cooperation with the Uzbek Ministry of Agriculture. There were recent discussions on the reorganization of the sector agencies in the project area. The Government is considering one option whereby the sector agencies would be reorganized into two regional agencies in charge of bulk water operations, water distribution, and sewerage, with one in charge of the installations in Khorezm Oblast and the other one in the Republic of Karakalpakstan. The Government has agreed that it will, for the purpose of consolidating responsibilities for water production and distribution in the project area, by January 1, 1998, prepare and furnish to the Bank a plan for restructuring of the water agencies, then implement the plan in accordance with a time schedule agreed upon with the Bank.

10 Because of high pumping costs and a poor population, bulk water supply in the project area is presently supported by large government subsidies. The two bulk water suppliers, for example, covered only 15 percent of their operating costs with tariff revenues in 1995. The water distributing agencies, on the other hand, more or less covered their cost of operation and to a limited extent the cost of maintenance. It is doubtful, however, whether tariff levels can be raised in the future to cover all operating and maintenance costs as well as increases in the working capital of the water agencies in the proposed project. Given the limited payment capacity of the population, a reduction in government subsidies by 2.5 percent per annum in real terms (after meeting the full costs of operation and maintenance) is about the maximum reduction of the subsidy that might be achieved.

11 Several alternatives projects were examined, and the proposed

project was found to be the least-cost option. Water demand management and leakage reduction programs were chosen over the alternative of increased water production. For rural sanitation, improved on-site facilities were a more economic alternative than creating or expanding centralized, water-borne sewerage systems because of low population densities.

Project Objectives

12 The project has two objectives. The first is the provision of safe drinking water along with improved hygiene education and sanitation facilities for the Republic of Karakalpakstan and Khorezm Oblast. Specifically, this objective would decrease the incidence of water-borne diseases among the population, particularly diarrheal diseases among children. The second objective is to strengthen institutional capacity for management, operation and financial performance of the regional water supply and sanitation utilities as well as the regional Centers of Health and the Sanitary Epidemiological Services.

Project Description

13 Project Components. The proposed project comprises four main components: (a) water supply and distribution; (b) sanitation, health and hygiene; (c) technical assistance; and (d) project management, design and supervision.

14 Water Supply and Distribution Component (US\$68.2 million or 68 percent of total base cost). This component has four main subcomponents:

(a) Main Pipeline Supply System (US\$38.8 million). This subcomponent would: (i) replace or rehabilitate where appropriate sections of the distribution systems in Karakalpakstan and Khorezm Oblast; (ii) rehabilitate two water treatment plants; (iii) expand one water treatment plant; (iv) rehabilitate five ground water sources; (v) build additional trunk pipelines in Karakalpakstan; and (vi) rehabilitate the rural distribution centers in Karakalpakstan and Khorezm Oblast.

(b) Development of Local Water Supply and Distribution Systems (US\$21.0 million). The subcomponent would: (i) provide spare parts for about 300 desalinization units in Karakalpakstan as well as training for the operators of the desalinization plants; (ii) rehabilitate and develop ground water sources in Karakalpakstan and Khorezm Oblast (including the Chalysh wellfield); and (iii) expand demand-based rural water supplies in Karakalpakstan and Khorezm Oblast.

(c) Water Demand Management and Loss Reduction (US\$3.3 million). Wastage of water is high, particularly in the urban areas, due to a lack of incentives to conserve

water at the level of water users. The low water price for domestic consumers and the absence of metering encourage inefficient use of water. This subcomponent would be implemented by a water utility with ample experience in demand management. The subcomponent has two items: (i) metering trials to test different approaches to metering water usage along with a consumer awareness program to provide practical advice on means of reducing losses and optimizing water use; and (ii) funds to implement the most economic means of leakage reduction.

(d) Equipment for Operation and Maintenance (US\$5.2 million). The Vodokanals, Agrovodokanals and the bulk water suppliers face severe difficulties in maintaining the water supply systems due to a shortage of equipment and materials. This subcomponent would address this by providing equipment which would be identified by an Institutional Strengthening Consultant and a Demand Management Consultant. There are two items in this subcomponent: (i) identification and purchase of small equipment, tools and spares; and (ii) identification and purchase of major equipment.

15 Sanitation, Health and Hygiene Component (US\$11.2 million or 11 percent of the total base cost). This component has three subcomponents:

(a) Rural Sanitation (US\$2.0 million). This component would promote construction of improved latrines (elevated ventilated latrines) through the participatory approach developed during the Pilot Project, and installation of hand washing facilities in selected households, schools, primary health care services, canteens and public places in selected collective farms. The community-based Kolkhoze Committees would make decisions about the identification, design, implementation, operation and maintenance of the sanitation schemes to be put in place. The subcomponent would provide around 7,500 improved latrines and handwashing facilities, covering about 5 percent of the rural population in both regions.

(b) Health Promotion and Hygiene Education (US\$4.0 million). This subcomponent would cover health promotion and hygiene education of the urban and rural populations of Karakalpakstan and Khorezm Oblast. As such, it complements the sanitation and hand pumps subcomponents of the proposed project, and is an integral element of the overall strategy for improving health and hygiene among the population through community-based approaches. Health specialists would assist the Kolkhoze Committees in developing and implementing the health promotion and education activities. The subcomponent would also cover the costs

of an intersectoral committee that would aim at reviewing and assisting project activities.

(c) Water Quality Monitoring and Strengthening of Sanitary Epidemiological Services (SES) (US\$5.2 million). The principal objective of this subcomponent is to improve water quality monitoring, and sanitation and hygiene inspection of households and communal facilities in Karakalpakstan and Khorezm Oblast. Health specialists would participate in community-based activities, assisting the Kolkhoze Committees in improving water supply, sanitation and health in rural communities. In addition, the institutional and organizational efficiency of the SES would be enhanced by improving the quality of health and water quality data collection, analysis and reporting, and integrating the data reporting for the region into the Pilot Project's Geographic Information System (GIS) on a demonstration basis.

16 Technical Assistance Component (US\$8.2 million or 8 percent of total base cost). This component has three subcomponents:

(a) Institutional Strengthening of Water Utilities and Bulk Providers (US\$6.7 million). This subcomponent would address the present deficiencies in the six organizations involved in providing water and sewerage services to the project area. It is expected that in the near future these agencies will be combined into two regional organizations, which will improve the situation. The item would consist of: (i) a program for carrying out regularly preventive maintenance; (ii) a program for monitoring and reducing operating costs; (iii) a program for reduction and management of accounts receivable; (iv) design and operation of a utility accounting system, including cost accounting; and (v) in-house and foreign training programs. These programs include consultancy services and training of trainers.

(b) Tariff Study (US\$0.6 million). This subcomponent would finance a water and sewerage tariff study, which would lay the foundation for the introduction of new water and sewerage tariff rates for the various consumer groups. It includes consultancy services for the formulation and implementation of the new tariff structure and office equipment.

(c) Refinancing of Feasibility Study (US\$0.8 million). This subcomponent would refinance the Kuwait Fund's Project Feasibility Study.

17 Project Management, Design and Supervision Component (US\$8.4 million or 8 percent of total base cost). This component would cover the costs of project management, project design, and

construction supervision by the Project Implementation Unit (PIU), with advice and assistance from foreign consultants. Included in this component are consultant services, staffing of the PIU, including the Director in Tashkent, the regional representatives, the GIS section, and support staff.

18 Refinancing of Pilot Water Supply Engineering Project Component (US\$5.0 million or 5 percent of total base cost). The Pilot Project funded the construction of a self-managed water supply scheme in the peri-urban areas of Nukus (the largest city in Karakalpakstan) and the preparation of detail designs and bid documents for the proposed project. The Pilot Project components would be refinanced by the proposed project as agreed with the Government of Uzbekistan (GoU) in the Pilot Project Loan Agreement. Upon the effectiveness of the proposed project, the Bank would withdraw from the Loan Account and pay to itself the amount required for repayment of the Pilot Project Loan. The Pilot Project Loan would then be canceled.

Cost Estimates

19 Project cost have been identified for the major components as indicated in the table below.

Summary of Project Costs
(US\$ million)

	Local	Foreign	Total	% Foreign Exch.	% Total Base Cost
Water Supply and Distribution	19.90	48.30	68.20	71	68
Sanitation, Health and Hygiene	2.79	8.42	11.21	75	11
Technical Assistance	0.06	8.11	8.16	99	8
Project Manage. & Supervision	0.10	8.32	8.42	99	8
Refinancing of Pilot Project	--	5.00	5.00	100	5
Total Base Cost	22.85	78.15	101.00	77	100
Physical Contingencies	2.38	6.68	9.06	74	9
Price Contingencies	1.61	5.33	6.94	77	7
Total Project Cost	26.84	90.16	117.0	77	116

20 A financing plan which includes possible financing from other multi- and bilateral funding agencies is shown in the table.

Financing Plan a/
(US\$ million)

	Local	Foreign	Total	% Total Cost
IBRD	6.5	68.5	75.0	64.1%
Kuwait Fund	4.2	15.7	19.8	17.0%
KfW	3.4	6.0	9.4	8.1%
GoU	12.7	--	12.7	10.9%
Total	26.8	90.2	117.0	100.0%

a/ Differences are due to rounding.

Implementation

21 Overall responsibility for project implementation would come under the aegis of the Uzbek State Committee for Forecasting and Statistics (Goskomprognostat). The PIU within Goskomprognostat would be responsible for the coordination of project implementation.

22 The PIU was established within Goskomprognostat in a capacity-building effort during the preparation of the Pilot Water Supply Engineering Project. A PIU is necessary because the project involves a number of regional and local agencies, with little experience in executing externally-funded projects. An Interagency Project Working Group (IPWG), with representation from senior officials from agencies participating in the project, was established to advise the PIU on the coordination of project implementation activities.

23 An integral part of the project is community participation in selecting and implementing water supply improvements. Using a demand-based approach, communities would select various options (hand pumps, piped water supply, desalinization, etc.) based on their willingness to pay for the improved water supply. Communities would be expected to cover the full operations and maintenance cost of the schemes which would be designed and costed with the participation of the selected communities according to the level of service they choose. Community Water User Associations would be formed to represent the communities in negotiations with the contractors for project implementation and operation. The Associations would also be responsible for collecting water tariffs and monitoring excessive water use and water losses. The experience gained in implementing two pilot project for sanitation, health and hygiene has been used in laying out the step-by-step community involvement in the implementation of this component.

Project Sustainability

24 The proposed project would, through a program of technical assistance, lead to substantial improvements in operations and maintenance of the water agencies. This would increase the sustainability of the water sector in Karakalpakstan and Khorezm Oblast, provided that the technical assistance is well received and incorporated into the mid- to long-term operations of the water agencies. To what extent financial sustainability can be achieved will remain to be seen. In many parts of the project area, up to 90 percent of household cash income is used to buy food. If the proposed project raises water tariffs to say 3 percent of household income, many poor families would be further marginalized. Moreover, the political will to significantly increase water tariffs for domestic customers is not yet present. Therefore it may take some time until the current government practice of using tax revenues (mainly from cotton exports) to fund the large operating deficit of the water sector would give way to more sustainable operating principles. Under the Pilot Project, a program was tested to increase domestic tariffs on an area-by-area basis. The results were that residents of Kizketken (a community of some 30,000) agreed to an increase in water tariffs in exchange for improved service and a larger say in the running of the local water utility.

Lessons from Past Bank Projects

25 The Bank has limited experience in Uzbekistan. Four projects have been signed, with three currently under implementation: the Institution Building and Technical Assistance Project (Ln. 3650-UZ); the Pilot Water Supply Engineering Project (Ln. 4090-UZ); and the Cotton Sub-Sector Improvement Project (Ln. 3894-UZ). The regional department's FY94 Annual Report on Portfolio Performance in Russia and Central Asia highlighted several lessons learned in the region including: (a) the challenge of identifying a counterpart team with sufficient authority to move the project forward; (b) the difficulty of coordination among key government agencies on critical issues; (c) the importance of setting up PIUs early in the project cycle and the training of their staff in Bank procurement and disbursement procedures; and (d) the importance of involving local institutes in project design and preparation. A review of lessons learned from water supply and sanitation projects world-wide shows that, despite efforts at capacity building for the public institutions concerned, few countries achieved acceptable levels of performance for their public water and sewerage utilities, and that the financial performance of these utilities was dismal. Some of the reasons for these deficiencies include: (a) lack of clear sector policies; (b) lack of management and financial autonomy; (c) inexperience in project implementation; and (d) lack of participation of users and other stakeholders in the decision-making process.

26 To the extent possible, these lessons have been incorporated into the preparation and design of the proposed project through: (a) an extensive social needs assessment survey, which was completed with the participation of local institutes, as well as a follow-up survey of water usage and losses in piped distribution systems to domestic, commercial and industrial consumers; (b)

implementation of community-based pilot projects for water supply and distribution (see 1/) and for health, hygiene and sanitation, which were carried out during project preparation; (c) an Interagency Working Group was set-up to provide overall leadership for the project; (d) a PIU has been established to supervise all project preparation and implementation activities; and (e) the GoU executed the Kuwait Fund-financed project preparation feasibility study and the PHRD-funded pilot demonstration activities.

Poverty Category

27 The proposed project would be a Program of Targeted Interventions. The beneficiaries of the proposed project would be the inhabitants of the two poorest regions of Uzbekistan--itself one of the poorer countries in the former Soviet Union. The proposed project would help meet the local needs of safe drinking water, adequate sanitation, and basic health care.

Environmental Aspects

28 The proposed project is classified as environmental category B. The project is intended to implement a series of urgent subprojects to improve the viability and operation of the water supply and sanitation sectors. The overall impact would be a substantial improvement in public health and quality of life while maintaining or improving the quality of regional water resources. The project activities involve primarily the rehabilitation of existing pipelines and treatment plants by repairs, technical assistance, training, and the replacement or provision of spare parts and equipment. New constructions are limited to the completion of suspended civil works, and development of alternative water sources. Impacts on traffic flow and problems of noise and dust from construction activities would be temporary, and suitable mitigation measures would be taken to minimize these impacts. Adverse environmental impacts of the project are therefore insignificant when compared to the overall benefits.

Program Objective Category

29 The project meets the criteria for poverty reduction. It would benefit the poorer communities in the most economically depressed region of Uzbekistan by improving living conditions through the provision of basic infrastructure and social services.

Benefits

30 The immediate impacts of the project would be a safe and reliable water supply services for about 1.46 million people. The project would also directly benefit about 25,000 inhabitants with improved sanitation facilities.

31 Sensitivity analysis was performed on water losses, cost and time savings, sales volume, cost overruns, and project delays. Plausible changes in the key variables produced IERRs ranging from 11.9 percent to 18.2 percent. For the overall project, the IERR is

17.9 percent. The economic analysis' key assumptions are: (a) cost savings of not having to buy water from vendors; (b) cost savings of not having to spend time fetching water; (c) cost savings of not having to boil water; and (d) the consumer surplus on the increased quantity of water used.

Risks

32 Various categories of risks are associated with the implementation of the project. These relate to the risk of: (a) completing the construction of the facilities on time and at the forecast cost; (b) building the required capacity of the institutions to properly manage and maintain existing facilities and those to be constructed under the project; (c) the benefiting population lacking the capacity to pay for the improved services; (d) achieving timely payment of water bills by large customers and governments agencies; and (e) delays in the implementation of the Government's reform program. Should all these risks occur simultaneously, the adverse impact on the implementation of the project could be severe. This, however, is unlikely to happen. Considerable safeguards are built into the project for mitigating the risks. First, the project cost estimates include adequate provisions for price and physical contingencies. Second, strong project management with the support of experienced consultants would be in place at project start. Third, a comprehensive technical assistance and corporate development program with training, including twinning arrangements and the assistance of experienced consultants, should ensure that staff and management not only become familiar with modern utility management practices, but more important, apply them. Fourth, implementation of water conservation measures should diminish water waste in the future and lead to a reduction in operating expenses. Fifth, careful planning and execution of a comprehensive mid-term review should make it possible to take corrective actions, if necessary; and finally, the proposed set of monitoring indicators and strong supervision should help realize the objectives of the proposed project.

1/ The German KfW is implementing a pilot operation of three small-scale water supply and distribution projects in the more remote rural areas.

Contact Point: Roger Batstone, Task Manager.
The World Bank
1818 H Street N.W.
Washington, D.C. 20433
Telephone No.: (202) 473-3116
Fax No.: (202) 477-3285

Note: This is information on an evolving project. Certain components may not necessarily be included in the final project.

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Annex

Environmental

The proposed project is a category B. Minor disturbance from construction of secondary and tertiary piped water distribution systems, pumping stations, storage reservoirs and upgrading of potable water treatment plants are foreseen. The project has a sanitation component consistent with the water supply improvements to handle any increase in sewage flow. The project includes an environmental monitoring system which would perform bacteriological and basic chemical analyses of surface and ground water in the project area as well as collect health and sanitation data. This monitoring data would be integrated into a computer-based geographic information system (GIS) and made available to government ministries and other projects. The GIS would allow tracking the quality of surface and ground water on a longer-term basis and help identify problem health areas. The project would also create an inter-sectoral committee for Water, Sanitation and Health comprised of representatives from the Ministry of Environment, Ministry of Health, local NGOs, and members of the Project Implementation Unit. The committee would act as a forum for environmental and health concerns and coordinate the dissemination of information regarding the health and environmental impact of the project.