FINANCIAL ANALYSIS

A. Introduction

1. A financial analysis was carried out for the project in accordance with Asian Development Bank (ADB) guidelines.[1] The project will improve climate resilience and the health and living conditions in six districts of the Republic of Karakalpakstan (RK) by rehabilitating and expanding their water supply system. Established as an interregional bulk producer and supplier of water from the Tuyamuyun system to the water distribution agencies, the State Unitary Enterprise Department for Operation of Interregional Water Supply Tuyamuyun-Nukus (TN) has recently become the state-owned enterprise solely responsible for providing water supply and sanitation in the RK. TN functions, but has multifaceted concerns and challenges. Its infrastructure is deteriorated and its services have become unreliable. Its leakage losses are climbing yet the quality of the water it produces is poor. Only over a third of the RK's population is connected to the TN's centralized water supply system—65% in urban centers and 22% in surrounding settlements. Many households consider the water supplied by TN to be unhygienic, causing increased incidence of waterborne diseases in the project areas.

B. Methodology and Key Assumptions

2. The financial analysis was undertaken from TN's perspective in two phases. Upon completion, the project will generate revenues from customers served. The first phase conducted a financial cost-benefit analysis to assess the financial revenues and viability of the project. In conformity with ADB guidelines, this entailed an estimation of the project's financial internal rate of return (FIRR) followed by a comparison of the resulting FIRR with the calculated weighted average cost of capital (WACC) for the project. The second phase of the analysis assessed the overall impact of the project on TN's financial sustainability. TN has for years been the recipient of transfers from the central government. The analysis demonstrates how the rehabilitation of RK's water supply systems in the project areas, coupled with improvements brought about by project interventions such as nonrevenue water management, will impact TN's financial performance and sustainability over a 10-year period.

1. Project Costs, Outputs, and Implementation Schedule

3. The total estimated cost of the project is $172.3 million. To be implemented over 6 years from 2018 to 2023, the project was envisioned to produce two major outputs: (i) water supply infrastructure rehabilitated, expanded, and upgraded in the six selected districts of the RK including infrastructure works for water treatment plants, secondary trunk mains, water distribution centers, distribution mains, distribution networks, and other components; and (ii) institutional capacity strengthened for performance efficacy and sustainability to enable TN to operate more effectively and efficiently in response to demand through an improved asset base, heightened climate change awareness considerations, more stringent corporate governance performance standards, and strengthened public accountability.

4. The project will be funded by a loan of $145 million from ADB's concessional ordinary capital resources. The government will contribute $27.3 million in the form of taxes and duties. The executing agency is Kommunhizmat (CSA), the government agency with oversight responsibility for the management of water utility services nationwide and the implementation of projects funded by international donors. The implementing agency is TN, operating under the

[1] ADB. 2005. *Guidelines for the Financial Management of Projects.* Manila.

guidance and supervision of CSA.

2. General Approach and Assumptions

5. For the two-phased analysis, two financial models were developed using cost and financial parameters derived from the project design and TN's 5-year audited financial statements. For the benefit-cost model, incremental net revenues were calculated based on an analysis of RK's tariff regime, population and water consumption projections for the selected districts, and project cost estimates. For the financial sustainability analysis, TN's past income and expenditure patterns, audited financial statements, and the project cost and design parameters were used to build a model covering revenue forecasts, the project implementation period, and the first 5 years of operation. The underlying assumptions used in both models are as follows:
   (i) The models are presented in sum in mid-2017 prices.[2]
   (ii) Physical contingencies were computed at 3% of the base cost estimates for civil works and equipment.
   (iii) Price contingencies were computed at an average of 1.6% on foreign exchange costs and 7.1% on local currency costs.
   (iv) The estimated costs include provisions for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
   (v) Interest during implementation was calculated for the ADB loan at 2% per annum.
   (vi) The projected water supply demand and production is based on the population growth forecast for the six selected districts as provided by the Design Institute of the Ministry of Housing and Communal Services (MHCS).
   (vii) The water supply performance parameters, including technical losses and unaccounted-for water, were provided by TN for 2012–2016.
   (viii) Current water consumption in the project areas was derived using the results of the social and poverty assessment survey conducted as part of the project preparatory technical assistance (TA).

C. Financial Benefit–Cost Analysis

1. Sources and Estimation of Financial Revenues

6. The financial analysis was prepared based on an analysis of the tariff structure of the RK for water which shows that tariffs for residential, commercial, and industrial users have been increased twice a year since October 2012. For residential consumers, the average nominal increase per annum is 19.2% (the average annual real rate of increase is 12.3%). For commercial and industrial users, the increase has been more modest at the nominal rate of 3.8% but the rate is applied to higher tariff bases. The current tariff rates for water are SUM675 per cubic meter (m^3) for residential users and SUM2,100/m^3 for commercial, industrial, and institutional establishments.

7. The financial revenues were derived primarily from tariffs to be charged to domestic consumers, commercial users, and institutional establishments. Forecasts of the population to be covered by the project estimated that the district centers would have 218,000 residents by 2023, reaching 283,300 by 2042. Residents outside the district centers who will also benefit from the

[2] In September 2017, the Central Bank of Uzbekistan devalued the sum by 92.38% to SUM8,100 = $1. While the government acknowledges that this could affect the total project cost, a methodology for estimating the impact of the devaluation on construction prices, and more generallly on inflation, has yet to be developed and agreed. Bids received on a recent procurement for a World Bank project reflected that the estimated contract costs in United States dollars have remained unchanged from the pre-devaluation estimates as of November 2017.

project were estimated at 175,449 by 2023, increasing to 228,000 by 2042.

8. For the FIRR estimation, the tariff adjustments assumed included a worst-case scenario that the local currency equivalent of the total project cost would increase by 112% from SUM794 billion to SUM1,684 billion. For residential consumers, this would mean an increase in tariffs of 180% in real terms from SUM675/m^3 to SUM1890/m^3 by 2023 when the benefit period of the project starts, increasing thereafter by 5% per annum. Nominally, this entails revising the tariff for residential users from the current rate of SUM675/m^3 to SUM2,786/m^3 over 6 years. The assumed increase in tariffs requires an annual real rate of increase of 14.5%, which is more than 12.3%, the historical average of the real rate of tariff increases in the RK over the last 5 years. However, these tariff rates were discussed with the Ministry of Finance (MOF) and TN and both agreed they would still be reasonable given the high level of water demand in the project areas and the low tariff rate increases in the last 5 years. The socioeconomic survey conducted under the TA revealed that the targeted households had the willingness to pay for the potential tariff increases since most of the them are only able to access clean and safe water through trucks or vendors at the much higher cost of SUM5,000/m^3. For commercial and industrial establishments, the same rate of tariff increase had been assumed, in real terms, from SUM2,100/m^3 to SUM5,880/m^3 by 2023, and increasing thereafter by 5% per annum. Nominally, this means revising the tariff rate from SUM2,100/m^3 to SUM8,731/m^3. These assumed tariffs adhere to the principles of full cost recovery, which align with the latest fiscal and economic reforms being pursued by the government.

9. An affordability analysis was also conducted on the assumed tariffs. The poor households typically consume 50% of the average daily demand, resulting in water demand of about 60 liters per capita per day. With the tariff adjustment assumed by 2023, the monthly household water bill would be SUM29,085 per month. This constitutes about 2.3% of the average monthly income of the poorest households in the region, and is well within the international standards of 3%–4% of household monthly income deemed affordable for water tariffs.

2. FIRR Financial Internal Rate of Return Calculation and Sensitivity Analysis

10. The resulting base case FIRR is 1.42%, which exceeds the estimated WACC of 0.45% (Table 1). A sensitivity analysis, undertaken to test financial viability, reconfirmed the financial viability potentials of the project under varying scenarios.

Table 1: Summary of Financial Evaluation and Sensitivity Analysis

Item	FIRR (%)	NPV[a]	Switching Value	Sensitivity Indicator
Base Case	1.42	193,162		
Case 1: 10% increase in capital cost	0.77	67,901	21.9	4.56
Case 2: 10% increase in O&M	1.31	171,171	131.5	0.76
Case 3: 10% decrease in tariff revenues	0.59	26,594	17.1	5.84
Case 4: 10% increase in capital cost 10% decrease in tariff revenues	0.15	(120,659)		
Case 5: Delay in tariff revenues by 1 year	0.59	27,636		

( ) = negative, FIRR = financial internal rate of return, NPV = net present value, O&M = operation and maintenance.
[a] Calculated using a discount rate equal to the estimated weighted average cost of capital of 0.70%.
Source: Asian Development Bank estimates.

3. Tariffs and Regulations

11. The government's policy is to revise tariffs twice a year, in line with increased costs of production. Prior approval by the MOF is required to implement any tariff revision. In accordance with government policy, the MOF has allowed tariffs in Karakalpakstan to increase twice a year,

at a nominal average of 19.2% per year.[3] However, these tariff increases have not been sufficient for TN to fully recover its operation and maintenance costs and service its existing debts, as demonstrated by its historical financial performance. This has vital implications for the financial sustainability of TN and largely explains its continued and persistent reliance on central government subsidies.

D. Financial Sustainability Analysis

1. TN's Historical Performance

12. The audited financial statements of TN indicate that its net sales from operations had been growing at an annual average rate of 20%. In 2016, TN's net sales reached SUM24.4 billion, more than double the SUM11.4 billion reported in 2012. Despite this record growth rate, TN's operating costs have increased much faster. While depreciation and interest expense comprise most of these operating costs, the analysis revealed that materials, fuel, and salaries also constitute a large proportion of these costs. Hence, TN has been dependent on central government subsidies. Without these subsidies, which are reported in their statements as other operating income to contribute to their debt servicing, TN's financial position would have deteriorated and suffered.[4] As of 2016, TN's total assets have reached SUM134.7 billion. Most of these assets have been financed from long-term debt, which amounted to SUM43.7 billion. A summary of the historical performance of TN from 2012 to 2016 is in Table 2.

Table 2: Historical Performance
State Unitary Enterprise Department for Operation of Interregional Water Supply Tuyamuyun-Nukus (2012–2016)

(SUM million)

Item	2012	2013	2014	2015	2016
Income Statement					
Net Sales	11,422	13,741	19,366	21,100	24,452
Net income	(488)	(863)	13	304	364
Balance Sheet					
Current Assets	8,748	10,144	12,376	13,231	11,844
Noncurrent Assets	59,320	70,691	73,147	71,085	122,887
Total Assets	**68,069**	**80,836**	**85,524**	**84,315**	**134,731**
Current Liabilities	4,219	4,668	4,883	1,914	3,450
Long-term Liabilities	40,465	47,344	44,733	43,703	43,676
Total Liabilities and Equity	**68,069**	**80,836**	**85,524**	**84,315**	**134,731**
Key Financial Ratios					
Current ratio	2.07	2.17	2.53	6.91	3.43
Days in receivables	47	55	76	78	53
Operating Ratio	1.04	1.05	0.93	0.99	0.97
Debt service coverage ratio		0.11	0.09	0.12	0.84
Debt–equity ratio	1.91	1.80	1.38	1.18	0.54

( ) = negative.
Source: State Unitary Enterprise Department for Operation of Interregional Water Supply Tuyamuyun-Nukus audited financial statements.

[3] Water tariffs were reviewed by MOF and reset once a year until 2009, but thereafter tariffs have been reset twice a year in April and October. Presidential Decree No. 5241, issued on 16 November 2017, has mandated the MOF, jointly with the MHCS and all other national and local authorities concerned, to review the current tariff setting procedure and to set up a mechanism for establishing flexible tariffs that ensure the profitability of water and sewerage organizations.

[4] Resolution No. 66 of the Cabinet of Ministers dated 7 March 2012 stipulates that the government will subsidize an average of 93% of TN's debt servicing requirements until 2043.

2. Results of Financial Sustainability Analysis

13. The results of the financial sustainability analysis show that TN will generate SUM327.9 billion in net sales by 2027 with the additional revenues contributed by the project. The financial model forecasts net income from 2019 to 2027 to be positive, ranging from SUM11.4 billion to SUM116.4 billion. In this scenario, government subsidies caused by past debts and inefficiencies will continue but decline. Selected indicators from the financial sustainability analysis are in Table 3. The analysis demonstrates that as long as the required subsidies are received by TN in the form of other operating income, and/or it is allowed to increase its tariff rates adequately, TN can meet the minimum acceptable levels prescribed by the proposed covenanted ratios.

Table 3: State Unitary Enterprise Department for Operation of Interregional Water Supply Tuyamuyun-Nukus Financial Projections and Indicators (2019–2027)

(SUM million)

Item	2019	2020	2023	2025	2027
Income Statement					
Net Sales	39,490	50,732	141,406	222,132	327,930
Net income	11,445	4,023	18,457	61,336	116,417
Balance Sheet					
Current Assets	88,487	126,387	259,305	360,467	542,321
Total Assets	**340,162**	**782,231**	**1,615,607**	**1,512,818**	**1,479,129**
Current Liabilities	7,680	8,552	165,852	228,027	252,438
Total Liabilities	208,763	627,020	1,394,448	1,194,866	960,136
Total Liabilities and Equity	**340,162**	**782,231**	**1,615,607**	**1,512,818**	**1,479,129**
Covenanted Ratios					
Current ratio >1	11.52	14.78	1.56	1.58	2.15
Days in receivables <90 days	89	47	82	86	85
Operating ratio >1	1.29	1.10	1.30	1.45	1.58
Debt service coverage ratio >1.1	1.25	1.16	1.51	1.24	1.71

Source: Asian Development Bank estimates.

3. Deepening and Accelerating Water Tariff Regulatory Reforms

14. The financial sustainability analysis underscores why ongoing water tariff regulatory reforms in Uzbekistan should be deepened and accelerated. In the case of TN, there is a need to review policy and regulatory constraints that could impede its ability to charge higher tariff rates, even if these rates would still be affordable to the targeted household beneficiaries and even if the latter have expressed their willingness to pay higher water tariff rates in exchange for cleaner, safer, and more reliable water supply systems in their districts.

15. Policies enabling TN to charge higher tariff rates, particularly to client groups with higher affordable limits, will improve its ability to fully recover both capital and operation and maintenance costs, and to cover debt servicing requirements as well as planned and future investment requirements. This would improve financial sustainability, including a significant if not full reduction of its reliance on central government subsidies. Toward this end, an ADB TA on Uzbekistan's water and sanitation strategy development and capacity building has been designed to help the government improve its water tariff regulatory framework.[5]

[5] Financed by the People's Republic of China's Regional Cooperation and Poverty Reduction Fund, the $1 million grant-funded TA will prepare a medium-term urban WSS sector development and investment strategy, (ii) strengthen the capacity of the training center Kommunalukuv, and (iii) improve the water supply and sanitation regulatory framework of Uzbekistan.