

## ECONOMIC ANALYSIS

### A. Country Context

1. Uzbekistan is Central Asia's largest and most populous country. A resource-rich, doubly landlocked country strategically located at the heart of Central Asia, it has, since 2004, experienced a nearly stable economic growth rate of 8%, which has been driven mainly by public investment and resource-intensive industries such as copper, cotton, gold, and gas.<sup>1</sup> Despite a cautious and gradual approach to economic reforms after declaring independence from the Soviet Union in 1991, it has successfully transitioned from being a low-income to a lower middle-income country, albeit mainly through active state interventions, import substitution, and foreign exchange controls.<sup>2</sup> As Uzbekistan strives to reach high middle-income status by 2030, the country faces challenges to achieve greater economic, social, and political openness and to build a more competitive, diversified economy.<sup>3</sup> A new administration which came to power in late 2016 has embarked on a program of radical reforms to improve the lives of ordinary citizens, create an enabling environment for businesses, and strengthen ties with other Central Asian countries. It has adopted and initiated the implementation of the Strategy of Actions for the Development of Uzbekistan for 2017–2021, which outlines the country's political, economic, and social priorities, including measures to liberalize the economy.<sup>4</sup>

2. The strategy, among others, calls for reducing economic and social disparities, and is aimed at improving the quality of life in the cities and peri-urban areas as well as small towns in rural areas. This entails more balanced regional development that supports the modernization of Uzbekistan's infrastructure, particularly water supply and sanitation and solid-waste management (SWM), to improve public health and reduce negative impacts on the environment. The strategy also emphasizes diversification, underscoring the accelerated development of the tourism industry to further enhance its role and contribution to the economy.<sup>5</sup> The project will support Uzbekistan's development agenda by improving and expanding the provision of reliable and sustainable SWM services in the small cities and towns, in the process contributing to improved public health. It will also promote a clean environment, which has been proven across the globe to attract more international visitors,<sup>6</sup> thus magnifying the multiplier effects of tourism on the economy.<sup>7</sup>

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<sup>1</sup> In 2017, the Government of Uzbekistan reported a slower growth rate of 5.3%, reflecting the economic slowdown amid declining world commodity prices in 2013–2016 and the weak economic performance of the People's Republic of China and Russia which has adversely affected Uzbekistan's business exports. <https://www.intellinews.com/in-apparent-gain-for-transparency-uzbeks-report-gdp-growth-at-below-7-for-first-time-in-decade-131558>.

<sup>2</sup> United Nations Development Programme. *About Uzbekistan*.

<sup>3</sup> These include tackling growing youth unemployment; developing the private sector; improving public infrastructure; and maximizing the country's potential as a hub for transport, trade, and regional cooperation in Central Asia.

<sup>4</sup> The most prominent of these economic reforms has been the unification of foreign exchange rates in September 2017, which so far has resulted in reduced macroeconomic distortions, simplified business procedures, and liberalized prices.

<sup>5</sup> State Committee of the Republic of Uzbekistan for Tourism Development. *Tourism in Uzbekistan 2018*. Since 2017, the tourism industry in Uzbekistan has become one of the most dynamic in the economy with measures being taken by the government to improve tourism infrastructure, simplify visa procedures and registration, and foster increased international cooperation. The more popular sites outside Tashkent city are in the cities of Termez, Khiva, Samarkand, Bukhara, Shahrisabz, and Kokand.

<sup>6</sup> World Bank. 2014. Results-based Financing for Municipal Solid Waste. *Urban Development Knowledge Series. No. 20*. Washington, DC.

<sup>7</sup> Tourism not only creates jobs in the tertiary sector but also encourages growth in the primary and secondary sectors of the industry. This is known as the multiplier effect, which in its simplest form is defined as how many times money spent by a tourist circulates through a country's economy.

## B. Sector Context

3. Uzbekistan generates about 4 million tons of municipal waste annually, with waste generation per person declining from 200 kilograms (kg) in 2008 to less than 150 kg in 2018, although this varies significantly between the cities and peri-urban and rural areas.<sup>8</sup> More than 60% of the country's population is covered by waste collection services (footnote 8), although recent estimates indicate this coverage to be less (50%).<sup>9</sup> A waste characterization survey conducted in July–September 2019 to prepare the feasibility study for the project estimated municipal solid waste (MSW) generation per person in the Tashkent province at 0.75 kg per day and in the autonomous Republic of Karakalpakstan at 0.73 kg per day. These waste generation rates are well within the worldwide average of 0.74 kg per day<sup>10</sup> but are expected to increase as Uzbekistan attempts to evolve from lower middle-income to its aspired higher income status, and as the pace of urbanization accelerates amid envisioned economic growth.<sup>11</sup>

4. Since 2001, SWM responsibility was assigned to the departments of *hokimiyats* (municipal governments) with landscaping and territorial improvements. These entities, however, suffered from inadequate performance, weak accountability, and capacity deficiencies which eventually led to the collapse of the SWM system. By 2014, only 20% of the nation's entire MSW was being collected, as efforts became mainly focused on collection in Tashkent, the capital city. In 2017, as part of the government's sector reform program, the national SWM service responsibility was transferred from the *hokimiyats* to the State Committee of the Republic of Uzbekistan for Ecology and Environmental Protection (SCEEP). Furthermore, *toza hududs* (state unitary enterprises) were created in each of the country's 13 provinces, and the Republican Association of Specialized Enterprises for Sanitary Cleaning was established to promote, coordinate, and monitor the *toza hududs'* nationwide institutional development and capacity building. Assisted by the Asian Development Bank (ADB), the government formulated and adopted a national SWM development strategy in April 2019. The strategy's overarching goal is to integrate all SWM activities to (i) promote new approaches; (ii) create effective, reliable, and socially acceptable systems; (iii) minimize negative impacts on public health and the environment; and (iv) maximize the reduction, reuse, and recycling of waste.

## C. Project Rationale and Scope

5. The project will expand efficient and sustainable SWM services nationwide, specifically in the small urban centers and peri-urban areas as well as rural areas of the country. It will address the existing inefficiencies in the provision of SWM services not only through the usual capital investments in civil works and equipment but also through significant policy and institutional reforms. These reforms aim to develop the capacity of the *toza hududs* to effectively manage the assets to be acquired or created under the project through a transparent, performance-based, and gender-inclusive approach that leverages both public and private resources.

6. The project supports Uzbekistan's nationwide SWM subsector development. Its impact is to improve the environment, health, and living conditions of the people of Uzbekistan. Its

<sup>8</sup> United Nations Environment Programme and Zoë Environment Network. 2017. [Waste Management Outlook for Central Asia](#). Osaka (page 48).

<sup>9</sup> Asian Development Bank (ADB). 2019. *Technical Assistance to the Republic of Uzbekistan for Preparing Urban Development and Improvement Projects: Solid Waste Sector Development Project*. Consultant's report. Manila (TA 9715-UZB).

<sup>10</sup> World Bank. [http://datatopics.worldbank.org/what-a-waste/trends\\_in\\_solid\\_waste\\_management.html](http://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html).

<sup>11</sup> Kaza, S. et al. 2018. [What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development](#). Washington, DC: World Bank.

anticipated outcome is reliable and sustainable SWM services improved and expanded in small urban centers and peri-urban and rural areas nationwide. Output 1 (SWM subsector regulatory framework enhanced) will be achieved by assisting the government to formulate specific regulatory directives, as identified in the national strategy for SWM, including (i) establishing waste assessment protocols, (ii) strengthening waste transportation and disposal site regulations and compliance, and (iii) improving public accountability and tariff-setting methodologies.<sup>12</sup> Output 2 (Republican Association of Specialized Enterprises for Sanitary Cleaning and *toza hudud* capacity strengthened) will primarily (i) help the *toza hududs* transition into comprehensive managers of assets and service zones for provincial SWM operations, (ii) enable the Republican Association of Specialized Enterprises for Sanitary Cleaning to transform into a technical nexus for public and private SWM operators, (iii) institute performance-based management, and (iv) optimize public-private partnership practices in line with international best practices. Output 3 (environmental monitoring capabilities of SCEEP improved) will provide funding for capacity development, laboratory equipment, and vehicles. Output 4 (SWM collection and interim disposal services in small urban centers and peri-urban and rural areas improved nationwide) will build the functional asset bases of the *toza hududs*. Thirteen provincial vehicle maintenance service centers will also be constructed to provide for sustainable vehicle and equipment operation and maintenance.

#### D. Cost–Benefit Analysis

7. The cost–benefit analysis of the project was undertaken in accordance with the Guidelines for the Economic Analysis of Projects, and the Cost-Benefit Analysis for Development: A Practical Guide. The estimated costs and benefits of the project were quantified using the domestic price numeraire. For the analysis, the shadow price adjustment factors used were calculated based on the applicable labor and trade statistics of Uzbekistan. The factors derived were 1.10 for tradeable goods and services and 0.88 for unskilled labor. The annualized benefits and costs of the project were estimated over a 25-year period, allowing for a 5-year implementation period.

8. **Economic costs.** Capital and recurrent operation and maintenance costs, including physical contingencies but excluding all transfer payments, i.e., taxes and duties as well as price contingencies, expressed in constant mid-2019 prices, were converted into economic prices by applying appropriate shadow price adjustment factors (Table 1).

**Table 1: Conversion of Financial Costs into Economic Costs**  
(\$'000, in constant mid-2019 prices)

Expenditure Item	Financial Cost	Breakdown of Financial Cost Excluding Tax					Total Economic Cost
		Financial Cost Less Tax	Unskilled Labor	Skilled Labor	Nontradable Goods and Services	Tradeable Goods and Services	
Civil works and equipment	85,690	46,000	4,600	9,200	9,200	23,000	<b>47,673</b>
Capacity development and project management	12,190	7,860	157	2,201	1,572	3,930	<b>8,221</b>
Incremental administration	760	700	7	483	210	-	<b>699</b>
Total baseline cost	98,640	54,560	4,764	11,884	10,982	26,930	<b>56,594</b>
Physical contingencies	4,410	4,410	397	882	1,235	1,896	<b>4,546</b>
<b>Total project cost</b>	<b>103,750</b>	<b>58,970</b>	<b>5,161</b>	<b>12,766</b>	<b>12,217</b>	<b>28,826</b>	<b>61,140</b>

Source: Asian Development Bank estimates.

<sup>12</sup> Output 1 will also promote an enabling framework for public–private partnership and establish a performance management framework for efficient and sustainable SWM operations.

9. **Economic benefits.** The quantified economic benefits of the project focused on (i) the willingness to pay (WTP) for the improved incremental SWM services affecting about 30% of the population in small urban centers, peri-urban areas, and rural areas nationwide; and (ii) the incremental tourism benefits accruing to the economy as a result of a cleaner and consequently more attractive environment.

10. The WTP for the improved incremental SWM services was estimated using a contingent valuation methodology. The poverty and social assessment survey which was conducted during the transaction technical assistance (footnote 9) incorporated a WTP survey which determined that households were willing to pay at least SUM2,319 per person per month for improved SWM in the project areas.<sup>13</sup> To arrive at the incremental SWM consumption benefits for the project, the estimated incremental population served per year was multiplied by the WTP of SUM2,319 per person per month multiplied by 12 (to convert into an annual amount).

11. The tourism benefits were calculated based on the incremental increase in international visitors attributed to the project, as well as in their length of stay and average daily spending. Tourism statistics published by the State Committee of the Republic of Uzbekistan for Tourism Development show that Uzbekistan received about 5.34 million international visitors in 2018, registering a 99% increase from 2017 (footnote 5). With the project, it was assumed that the number of international visitors will grow at an annual rate of 9.0% from 2019 to 2044,<sup>14</sup> while in the without-project scenario an annual growth rate of 7.5% is assumed, which is lower but relatively high nonetheless given the additional reforms still envisaged for Uzbekistan's tourism industry.<sup>15</sup> Foreign visitors spend an average of \$210/day and stay an average of 7 days without the project. With the project, it was assumed that the number of international visitors, initially estimated at 470,000 in 2025, would stay 1 day longer and spend an additional \$5/day.<sup>16</sup>

12. **Economic internal rate of return calculation and sensitivity analysis.** The resulting base-case economic internal rate of return of the project is 17.2%, which exceeds the prescribed minimum discount rate of 9.0% (Table 2). This confirms that the project is economically viable, with economic benefits anticipated to be greater than the estimated economic costs. A sensitivity analysis, conducted to further test economic viability, demonstrated that the project will remain economically robust under scenarios that include (i) a 10% increase in capital cost, (ii) a 10% decline in benefits, (iii) a combination of scenarios (i) and (ii), and (iv) a delay in project benefits by 1 year (Table 3).

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<sup>13</sup> The poverty and social assessment survey which was conducted in August 2019 used a contingent valuation methodology to estimate the willingness to pay of SUM9,386/person/month. The survey indicated that households were willing to pay as much as SUM2,319/person/month because they associated a cleaner, safer, and more attractive environment with considerable public health improvements and increased employment as well as livelihood opportunities.

<sup>14</sup> Empirical studies about tourism in Central Asia confirm that clean cities and towns attract more tourists. E.g., see K. Kantarci, M. Uysal, and V. Magnini, eds. 2015. *Tourism in Central Asia: Cultural Potential and Challenges*. Toronto: Apple Academic Press. In addition, the impact of poor sanitation including SWM on tourist arrivals has been estimated to range from 5% to 10%. E.g., see Hutton G. et. al. 2007. *Economic Impacts of Sanitation in Southeast Asia: Summary Report*. Washington, DC: World Bank.

<sup>15</sup> The difference between the with- and without-project scenarios is 1.5%, which is below the lower boundary of the estimated impact of improved SWM on tourist arrivals (footnote 14) and so is conservative.

<sup>16</sup> Based on the travel statistics published by the government, international tourists will travel to the project towns and cities mainly to visit relatives and friends (70%). Others will visit to see the mosques, mausoleums, and other sites linked to the Silk Road and the conqueror Emir Timur.

**Table 2: Summary Cost–Benefit Analysis**  
(\$'000)

Year	Economic Costs		Economic Benefits		Incremental Net Benefits
	Incremental Capital Cost	Incremental O&M	Incremental Consumption Benefits from Improved SWM	Incremental Tourism Benefits	
2020	11,667				(11,667)
2021	23,333				(23,333)
2022	23,333				(23,333)
2023	1,871				(1,871)
2024	936				(936)
2025		21,452	32,827	307	11,682
2026		21,452	33,319	580	12,447
2027		21,452	33,819	896	13,263
2028		21,452	34,326	1,260	14,134
2029		21,452	34,841	1,679	15,068
2030		21,452	35,364	2,157	16,069
2031		21,452	35,894	2,704	17,146
2032		21,452	36,433	3,326	18,306
2033		21,452	36,979	4,032	19,559
2034		21,452	37,534	4,833	20,915
2035		21,452	38,097	5,738	22,383
2036		21,452	38,668	6,761	23,977
2037		21,452	39,248	7,913	25,709
2038		21,452	39,837	9,209	27,594
2039		21,452	40,435	10,667	29,649
2040		21,452	41,041	12,302	31,891
2041		21,452	41,657	14,135	34,340
2042		21,452	42,282	16,188	37,018
2043		21,452	42,916	18,484	39,948
2044		21,452	43,560	21,050	43,157
					EIRR= 17.2%
					NPV @ 9%= 65,716

( ) = negative, EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance, SWM = solid-waste management.

Source: Asian Development Bank estimates.

**Table 3: Economic Evaluation and Sensitivity Analysis**

Scenario	EIRR (%)	NPV (\$'000)	Switching Value (\$'000)	Sensitivity Indicator
Base case	17.2	65,716		
Case 1: 10% increase in capital cost	16.1	60,687	49.4	2.0
Case 2: 10% increase in O&M	15.8	52,989	35.9	2.8
Case 3: 10% decrease in benefits	14.5	41,338	19.3	5.2
Case 4: 10% increase in capital cost 10% decrease in benefits	12.0	23,631		
Case 5: delay in project benefits by 1 year	13.5	38,755		

EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance.

Source: Asian Development Bank estimates.