Sector Assistance Program Evaluation

ADB's Support for Urban Infrastructure and Services in India, 2012–2022

Independent Evaluation ADB

Raising development impact through evaluation

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NOTES

(i) In this report, "$" refers to United States dollars.
(ii) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. "FY" before a calendar year denotes the year in which the fiscal year ends, e.g., FY2018 ends on 31 March 2018.

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Abbreviations

ADB	–	Asian Development Bank
AMRUT	–	Atal Mission for Rejuvenation and Urban Transformation
GDP	–	gross domestic product
IED	–	Independent Evaluation Department
LVC	–	land value capture
MFF	–	multitranche financing facility
MOHUA	–	Ministry of Housing and Urban Affairs
NRW	–	non-revenue water
NTL	–	nighttime light
O&M	–	operation and maintenance
PCR	–	project completion report
PPP	–	public–private partnership
SWM	–	solid waste management
TA	–	technical assistance
TOD	–	transit-oriented development
ULB	–	urban local body
WUS	–	water and other urban infrastructure and services

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Foreword

Rapid economic growth and urbanization in India is resulting in increasing and currently unmet demand for urban services, including water and sanitation, waste management, housing, and public transportation. Infrastructure investment requirements are great, but finances are limited. More integrated planning is needed to avoid unplanned use of land and water resources. Climate change is causing frequent extreme rainfall events, flooding, and droughts. Managing urbanization more efficiently through better planning and extending water supply, sanitation, waste management, housing, and urban transportation is of critical importance to India. The adverse impacts of climate change and health crises such as the coronavirus disease (COVID-19) pandemic point to the importance of sustainable and resilient urbanization.

This Independent Evaluation Department sector assistance program evaluation takes stock of the engagement of the Asian Development Bank (ADB) in two sectors—water and other urban infrastructure and services and urban transport—in India during 2012–2022. It assesses the progress made in providing various services, identifies lessons, and proposes directions for the future. The evaluation team consulted country officials and stakeholders and interviewed technical and professional staff within and outside ADB.

ADB has assisted India to manage its urbanization and to deliver urban services. The ADB program for this sector has helped increase access to reliable water supply and sanitation and flood management services by supporting the provision of infrastructure and building the capacity of local government officials in urban areas. ADB has supported urban mass transport and the government's policy of transit-oriented development. ADB's contributions were weaker in sewerage, wastewater treatment, solid waste management, and promoting private sector investment in the water sector.

Based on the lessons learned from ADB's engagement in the sector, the evaluation identifies some key areas for improvement: incorporating cross-sectoral synergies by adopting integrated approaches in projects, addressing project delays, accelerating the process of knowledge exchange, disseminating best practices at different levels of government, focusing more on solid waste management, and exploring avenues for greater private sector participation.

Emmanuel Jimenez
Director General
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Executive Summary

India is faced with several challenges in providing urban infrastructure and services. It is one of the most rapidly urbanizing countries in the world and home to the second largest urban population. The percentage of the population living in urban areas increased from 17.3% in 1951 to 31.6% in 2011 and is projected to reach 37.0% by 2031. Indian cities suffer from increasing congestion and pressure on urban services and housing. Major challenges include: (i) a lack of sufficient resources for infrastructure investments; (ii) the limited institutional capacities of state and municipal governments; and (iii) inefficient urban planning and fragmentation of responsibilities across multiple agencies and jurisdictions, hindering effective coordination of different activities. Revenue generated from own sources, both tax and nontax, by local governments is 0.72% of gross domestic product (GDP) compared with 7.00% in Brazil and 6.00% in South Africa. Intergovernmental transfers to municipal governments are only about 0.45% of GDP compared with 2.50% in the Philippines and 5.40% in Indonesia. Due to the weak revenue-raising capacity of urban local bodies (ULBs), much of the urban infrastructure is financed by the central and state governments. The Government of India, through its flagship programs and fiscal transfers, encourages state governments to undertake legislative and institutional reforms and help build the capacity of ULBs in delivering services.

The Asian Development Bank (ADB) has been supporting the Government of India to address its urban development challenges. ADB's financial commitment to the water and other urban infrastructure and services (WUS) sector in India during 2012–2022 was $4.15 billion, accounting for about 27% of ADB's total investment in the sector. A major part of the financing in WUS was for the water supply subsector (42%), followed by sewerage (17%), and flood protection (12%). The remainder was spread across other subsectors, including solid waste management (SWM) and policy and institutional capacity development. In addition to the $4.15 billion in commitments to operations in the WUS sector, ADB made financial commitments amounting to $2.64 billion in urban transport, 39% of ADB's total in that sector. This financing was mostly for metro rail and rapid rail transit projects.

This evaluation assesses the performance of ADB support for India in the WUS and urban transport sectors in 2012–2022, identifies the issues, and makes recommendations for future ADB's engagement in the sector.

Relevant Program Led to Progress in a Difficult Sector

ADB's program was generally relevant and aligned with its strategic priorities, catering to the increasing demands for basic urban services and for more efficient mobility. It also responded well to changes to ADB's strategic priorities over time. Over the evaluation period, greater attention was paid to climate and disaster resilience, improved urban planning, and better integration of land use and transportation. In some projects, ADB introduced innovative design features to ensure the climate resilience of cities and mobilized cofinancing. Technical assistance provided technology for flood forecasting and early warning systems. The ADB program has been coherent both internally and externally. There is evidence of cross-subsector synergies in WUS operations, for example, the integration of stormwater drainage and sewerage infrastructure. ADB's support to India was in general complementary with the support it received from other development partners.

ADB support has helped expand access to water supply and sanitation and contributed to thematic priority areas. Several ADB projects helped expand access to water supply and sanitation services. Some projects contributed to service delivery targets linked to very low-income areas such as the urban poor's access to piped water, slum upgrading, and public amenities, including provision of drains and community toilets. ADB also contributed to improvements in mobility and wider economic growth benefits through the completed Jaipur

Metro Rail project. Women now spend less time collecting water and managing household water needs. Their awareness of water management, health, and hygiene has increased, and they participated in project management and implementation. ADB also made contributions to water quality improvements and extending the hours of water supply per day. Some projects resulted in more efficient services in the form of reductions in water losses during distribution, and improvements in property tax collection efficiency. ADB contributed to institutional capacity improvements in project and financial management and procurement, which was evident in states and/or cities where ADB had long-term involvement.

Contributions to climate resilience were made by project components involving wastewater treatment, stormwater drainage, and urban flood protection. Contributions to climate change mitigation were not tracked in the closed projects but some ongoing projects include emission reduction indicators in their design and monitoring frameworks. The use of solar energy in sewage treatment plants, energy saving approaches to water supply, and capture of methane gas by new sewerage systems will help mitigate climate change. Mass transit infrastructure investments have already helped reduce emissions.

Nonsovereign operations in the WUS and urban transport sectors were limited during the evaluation period. The Office of Markets Development and Public–Private Partnership transaction advisory unit in India has just begun to explore public–private partnership (PPP) possibilities under its "creating investable cities" initiative.

Despite Progress, Challenges Remain

Notwithstanding ADB's contributions, its program faced substantial performance challenges. Its WUS sector portfolio performance in India was weak, particularly with respect to effectiveness and financial sustainability. Poor ratings for the achievement of outputs and outcomes reflected insufficient ADB input during the design of projects and unrealistic target indicators. The project completion and validation reports for most projects noted substantial implementation delays and long start-up periods. The poor record on financial sustainability, especially of water supply and sewerage projects, was mainly due to ULBs not making enough progress in raising tax and tariff revenues and their heavy dependence on government transfers, which can be unreliable. ADB has been taking some positive steps to address these challenges, the impacts of which may be reflected in future assessments and project completion reports.

ADB did not always design projects based on holistic and citywide integrated planning approaches. This made it difficult for it to harness synergies from cross-sector coordination and to enhance urban resilience and sustainability. For example, water supply projects need to consider water resource development and protection to ensure there is enough water of sufficient quantity for distribution. Similarly, integration of transport and land-use measures is essential to generate revenues for cities based on land value capture and to improve the financial viability of projects.

Poor project readiness resulted in project implementation delays. Inadequate project readiness in relation to land acquisition, obtaining state government and ULB licenses and permits, and other factors led to implementation being extended for most projects. Projects had start-up periods extending for up to 4 years, resulting in executing agencies failing to reach physical completion before loan closure even when closure dates were extended. Although ADB is addressing this issue through the project readiness financing facility and the use of advance contracting, it is too early to assess the impact of these approaches on project performance.

Adoption and scaling up of innovations and good practices have not been mainstreamed. While ADB has recently taken steps to identify project design innovations and good practices for replication in future projects, more can be done to accelerate the scaling up process countrywide. ADB has not sufficiently incentivized ULBs to undertake reforms to strengthen their financial sustainability or build their capacities.

SWM has generally been omitted from the designs of WUS project loans approved in recent years. One reason for this has been land acquisition and environmental safeguard issues faced by landfill

development. Given the importance of managing the rising volumes of municipal waste for urban sustainability and livability, ADB needs to find a way to resolve the issues facing landfills. Municipal SWM is essential for avoiding contamination of water bodies, managing flood risks, and promoting greater climate change resilience.

A weak enabling environment affected private sector investments. The lack of a dependable revenue stream (e.g., end-user tariffs or other tax and nontax revenues) is a major deterrent to greater private sector investments. A stronger enabling environment would make projects more attractive. Major efforts are needed in structuring attractive projects to take advantage of the significant PPP opportunities in the urban sector.

Recommendations for Improving Performance and Development Impact

To address these various issues, the evaluation recommends the following actions for ADB, to improve performance and development impact.

Recommendation 1. ADB should strengthen its comprehensive approach and adopt integrated planning and coordinated implementation in urban development and municipal service provision. It should aim to harness synergies between different subsector interventions, with a particular focus on integrating (i) water resources management with urban water supply and sanitation, (ii) water supply and sanitation with wastewater recycling, (iii) SWM with sewerage and stormwater drainage, and (iv) transit-oriented development with transport infrastructure investments. Assessments of the adequacy of surface and ground water resources and measures to conserve water should be integrated into the design and preparation of water treatment and water supply projects. This will require coordination between the agriculture, food, nature, and rural development and water and urban development sector groups. Going beyond support for knowledge work, transit-oriented development, including land value capture, needs to be integrated into urban transport infrastructure project design and development. Since such projects require expertise in numerous areas, including urban transport, planning, and commercial real estate, a multisector approach should be adopted, with appropriate institutional arrangements depending on the required ADB support as identified in sector assessments and road maps of development. Formal internal arrangements to enable inter-sectoral collaboration will be needed.

Recommendation 2. ADB should continue to take measures to reduce delays and improve the quality of implementation. ADB should continue recent steps to use advance contracting. It should revisit the scope of actions to be completed under the existing project readiness checklist. For example, it would be useful to require that 100% of a site needs to be acquired in the case of landfills as opposed to the 50% land acquisition requirement in the current checklist. ADB should also ensure that the loan approval team stays engaged in the early stages of project implementation so the loan design can relate well to start-up activities.

Recommendation 3. ADB needs to accelerate knowledge exchange and incentive mechanisms for successful project implementation practices across states and cities in India. ADB project teams need to facilitate knowledge transfer during the project design phase through meetings among ULBs and utilities. ADB should provide stronger support during the implementation process. Alternative lending modalities, e.g., results-based lending and sector development programs, should be explored to incentivize executing and implementing agencies to adopt good practices in institutional capacity development and governance and to perform better against subsector performance indicators. This way ADB can leverage its limited financing for transformational change.

Recommendation 4. ADB should stay engaged in the full cycle of solid waste management services, including implementation of landfill projects, given the importance of such services in ensuring urban sustainability and livability. It should address land acquisition and other issues relating to past failures to implement landfill projects and change project designs to focus on existing landfills rather than on new landfill sites. It should outsource reconstruction and operation to the private sector. Financing this critical infrastructure would provide an opportunity for ADB to facilitate improvements in the upstream collection and recycling process as well. ADB should include SWM components in urban flood management projects to address the impact of indiscriminate dumping of solid waste on urban flooding.

Recommendation 5. ADB should enhance its upstream policy and regulatory analytical work to strengthen the private sector enabling environment and to enable adequate and reliable revenue streams. It should identify areas that could ultimately generate private sector projects. This strategy could include (i) bolstering the creditworthiness or municipal borrowing capacity of large cities in the bond market and in the local bank borrowing market through support for mobilizing revenues from user charges and property taxes, improving financial reporting procedures, and instituting capital budgeting systems; (ii) supporting development of commercial aspects of transit-oriented development and land value capture; (iii) developing a commercially viable wastewater reuse PPP pilot project structure that takes into account key factors such as the creditworthiness of targeted industrial and agricultural customers and cost-effective transport of sewage between customer locations and treatment plants; and (iv) including affordable housing projects in the PPP project pipeline, together with government subsidies to ensure financial viability and attract experienced developers and investors. ADB should build on its experience in these areas and leverage the lessons learned.

Links Between Findings and Recommendations

Recommendation	Link to Issues and Findings
Recommendation 1. ADB should strengthen its comprehensive approach and adopt integrated planning and coordinated implementation in urban development and municipal service provision.	Core infrastructure investment programs are missing opportunities to capture synergies from links with other subsector interventions. For example, a lack of attention to water resource development and protection will affect the vital upstream and downstream infrastructure connections. Similarly, the absence of integrated transport and land-use measures means that an opportunity to capture revenues based on land values and to improve revenues for cities and to strengthen the financial viability of the projects is missed (paras. 27, 28, and 55–58).
Recommendation 2. ADB should continue to take measures to reduce delays and improve the quality of implementation.	Projects had very slow start-up periods, lasting up to 4 years. As a result, executing agencies failed to reach physical completion before loan closure even when closure dates were extended. ADB has now aligned its requirements to India's stringent project readiness checklist, but further strengthening is needed to suit individual WUS projects (paras. 62 and 63).
Recommendation 3. ADB needs to accelerate knowledge exchange and incentive mechanisms for successful project implementation practices across states and cities in India.	ADB has made insufficient efforts to replicate and scale up project design innovations nationwide or to incentivize governments to improve institutional development and governance. While ADB has recently in 2021 taken steps to identify project design innovations and good practices for replication in future projects, more can be done to accelerate the scaling up process (paras. 59 and 61).
Recommendation 4. ADB should stay engaged in the full cycle of solid waste management services, including implementation of landfill projects, given the importance of such services in ensuring urban sustainability and livability.	Despite the high volume of untreated waste and its impact on sustainable urbanization, there has been no solid waste management in the ADB portfolio in recent years. One reason for this has been the difficult land acquisition and environmental safeguard issues for landfill development (paras. 2, 27, and 50).
Recommendation 5. ADB should enhance its upstream policy and regulatory analytical work to strengthen the private sector enabling environment and to enable adequate and reliable revenue streams.	Private sector investments in the water and other urban infrastructure and services sector are rare. This is mainly due to a weak enabling environment. Lack of a dependable revenue stream through adequate end-user tariffs or opportunities to raise other tax and nontax revenues discourages private sector investments in the sector (paras. 66 and 67).

CHAPTER 1

Assessing ADB's Support for India in Addressing its Urbanization Challenges

A. Increasing Urbanization Puts Strain on Services

1. As India's cities became engines of economic growth, the share of the urban population as a percentage of the total increased rapidly from 17.3% in 1951 to 31.6% in 2011. The urban population is projected to reach 37.0% of the total by 2031.[1] India has overtaken the People's Republic of China as the world's most populous country, according to UN population estimates.[2] Rapid urbanization puts pressure on basic urban services, increasing gaps in provision of services, which are often substandard. It causes environmental degradation and raises the cost of economic activities.

2. About 41% of urban households in India use piped water into dwellings as the principal source of drinking water. About 49% use flush or pour-flush to septic tank type latrines. About 71% dispose of household wastewater without treatment into the drainage system.[3] Wastewater treatment capacity is 37%,[4] and untreated sewage is often dumped into rivers or other water bodies, polluting the environment. Women are affected the most from the poor quality of the water supply and sanitation system, as they are usually responsible for water and sanitation management as well as caregiving within the households. About 75%–80% of the total municipal waste is collected but only 22%–28% of this is processed and treated.[5] A large portion of the collected waste is dumped indiscriminately, clogging drains, and sewerage systems. According to the 2011 census, 69% of urban households live in owned dwelling units, 14% in rented dwelling units or other accommodation, and 17% in slums.[6] Between 2012 and 2018, the number of households living in congested houses went up by 57% and the per capita floor area of congested households declined from 111 square feet to 83 square feet.[7]

3. Rapid urbanization has resulted in a surge in transportation demand. According to the India Habitat III National Report,[8] the number of registered vehicles increased annually by 11.7% from 1981 to 2011, compared to a 2.0% annual average population growth rate. The unprecedented growth of motorized vehicles, coupled with limited road space, inadequate public transport services, and

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1 Government of India, Ministry of Housing and Urban Affairs (MOHUA). 2022. *National Urban Policy Framework: Strategic Intent.* New Delhi.
2 H. Ellis-Petersen. 2023. India Overtakes China to Become World's Most Populous Country. *The Guardian.* 24 April.
3 National Sample Survey Report No. 584. Drinking Water, Sanitation, Hygiene and Housing condition in India, NSS 76th round (July–December 2018).
4 Government of India, Ministry of Jal Shakti, Press Information Bureau. 2021. *Waste Water Treatment*. New Delhi
5 Satpal Singh. 2020. *Solid Waste Management in Urban India: Imperatives for Improvement*. ORF Occasional Paper No. 283. Observer Research Foundation.
6 Government of India. 2013. *State of Housing in India: A Statistical Compendium.* New Delhi.
7 Debarpita Roy and M.L. Meera. 2020. *Housing for India's Low-Income Urban Households: A Demand Perspective. Indian Council for Research on International Economic Relations (ICRIER).* New Delhi.
8 Government of India, Ministry of Housing and Urban Poverty Alleviation. 2016. *India Habitat III National Report*. New Delhi.

insufficient regulations and planning, has made accessing jobs, education, recreation, and other activities increasingly time-consuming, costly, and dangerous. Due to sprawling urban growth, residents in peripheral urban areas often have limited access to public transport systems and travel long distances for work and other needs using private vehicles. This contributes to congestion, high air pollution, and an increase in greenhouse gas emissions. The transport sector is responsible for 20%–35% of particulate matter (PM2.5) across Indian cities. Air pollution is as the second largest risk factor for disease in India, according to the 2019 Global Burden of Disease report.[9]

4. India is also affected by the adverse impacts of climate change. It was ranked the fifth most vulnerable country in the world to natural disasters and climate change in 2018 and the seventh most vulnerable in 2019.[10] In 2020, India housed three of the world's largest "megacities," i.e., urban agglomerations having more than 10 million inhabitants. Delhi was the second largest (after Tokyo) with 30.1 million people; Kolkata, eighth with 23.1 million; and Mumbai, ninth with 22.3 million.[11] Each of these has persisting major air quality and other severe urban environmental problems. Chennai and Kolkata are considered to be the Indian cities most at risk from sea level rise, and India as a whole, including its urban areas, is highly vulnerable to temperature rise.

B. Major Challenges Include Mobilizing Resources and Improving Urban Governance

5. Mobilizing resources for infrastructure investments is a major challenge in managing the provision of services in the urban sector. Meeting the growing demand for services—water supply; sanitation, wastewater treatment, flood management, solid waste management (SWM), housing, and urban mobility, including public transport, roads, and traffic management—requires large capital investments. A World Bank report in 2022 estimated that India needed to invest about $55 billion per year in urban infrastructure for the next 15 years to meet the needs of its fast-growing urban population.[12] However, the volume of total capital investment has averaged only $10.6 billion per year in the past decade. According to the report, India's cities will require $840 billion in capital investment for urban infrastructure and municipal services, including $300 billion for mass transit, between 2021 and 2036 (at 2020 prices). Cities are presently unable to access greater private financing due to the weak regulatory environment and poor revenue collection from charges for service provision and from other sources.

6. The Constitution of India originally placed the responsibility for urban development on state governments. As a result of the 74th Constitutional Amendment of 1992, responsibility for urban planning, water supply, sanitation, and SWM was transferred to urban local bodies (ULBs), which were recognized as the third tier of governance. However, the functional mandates of many municipal and/or urban services and infrastructure continue to lie with state government departments and state-controlled or state-owned agencies and parastatals in many states. The devolution of functions to ULBs was not matched by adequate power to levy taxes or to collect revenue from other sources. As a result, ULBs depended on resource transfers from central and state governments to perform the tasks assigned to them. About 72% of the financing of urban infrastructure is sourced from central and state governments, 15% from ULBs through their own surplus revenues, and the remaining 13% from various types of public and private commercial financing (footnote 12).

7. Property tax revenues of local governments represent just 0.15% of gross domestic product (GDP), compared with 0.60% for most developing countries and 2.10% for developed countries. Overall

[9] Global Health Data Exchange. Global Burden of Disease Study 2019 Data Resources.
[10] Germanwatch. 2021. *Global Climate Risk Index 2021: Who suffers Most from Extreme Weather Events? Weather-related Loss Events in 2019 and 2000–2019*. Berlin.
[11] World Population Review. Largest Metro Areas in the World 2023.
[12] World Bank. 2022. *Financing India's Urban Infrastructure Needs: Constraints to Commercial Financing and Prospects for Policy Action.* Washington, DC.

revenue receipts—own tax revenues, own nontax revenues, and transfers—were estimated to be 0.72% of GDP for 2019–2020.[13] This total was much smaller than in Brazil (7.00%) and South Africa (6.00%), for example. The own tax revenue of municipal corporations as a share of the state GDP varied from 0.10% in Karnataka to 2.00% or more in Delhi, Gujarat, and Maharashtra. About 70% of the total expenditures of municipal corporations in India in 2017–2018 were for current costs and 30% were for capital expenditure. About 25% of the total expenditure was spent on salaries and wages and 16% on operation and maintenance (O&M).

8. Intergovernmental transfers are low and unpredictable, making it difficult for local governments to implement medium-term plans to improve urban services in their jurisdictions. Based on available estimates, intergovernmental transfers to municipal governments in India were just 0.45% of GDP compared with 2.00%–2.50% in the Philippines and 5.40% in Indonesia.[14] The delay in the release of basic grants by the Government of India to state governments ranged from 13 to 559 days during 2015–2020 (this was often due to delays in the submission of utilization certificates by the state governments).[15]

9. Apart from the lack of financial resources, national, state, and municipal governments have limited institutional capabilities to meet the growing demands for urban infrastructure and services. City agencies are not always able to utilize their capital budgets fully because of their limited capacities to deliver infrastructure projects at scale. Indian cities suffer from inefficient urban planning, and a lack of institutional capacity and mechanisms for integrated planning and service delivery.

10. Coordinating the roles of different stakeholders in the provision of urban services is a challenge. Apart from the three main government entities—central, state, and provincial, urban local bodies—state-owned enterprises, private companies, and nongovernment organizations all share responsibilities for financing and providing urban services.

11. Fragmentation of service delivery responsibilities across agencies results in suboptimal service quality, operational efficiency, and environmental sustainability. For example, enhancing water security and reducing vulnerability to floods and droughts require integrated urban water resource management; water resources departments and other agencies need to collaborate to prevent unplanned urbanization that encroaches on natural drainage systems. Coordination is also required to prevent indiscriminate dumping of solid waste in drains and catchment areas, to adequately maintain and manage reservoirs, and to manage urban drainage and wastewater. A single platform to coordinate the activities of local planning, infrastructure building, and delivering services is essential for integrated city planning and urban development. Responsibilities are also fragmented across multiple jurisdictions.

12. Delivering seamless and safe citizen-centric mobility services by ensuring integration across transport modes and expanding pedestrian and cycling infrastructure requires institutional coordination across multiple agencies, and, at the metropolitan level, multiple jurisdictions. Implementation of multimodal integration (MMI), transit-oriented development (TOD),[16] and land value capture (LVC)[17]

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[13] Reserve Bank of India. Report on Municipal Finances.

[14] Centre for Water and Sanitation. 2020. *Strengthening Finances of Municipal Governments*. A paper prepared for the NFSSSM alliance, Centre for Water and Sanitation, CRDF, CEPT University, Ahmedabad, October 2020.

[15] Comptroller and Auditor General of India. 2022. *Audit Report Chapter VI: Financial Resources of Urban Local Bodies*. New Delhi.

[16] Transit-oriented development (TOD) refers to compact, high-density, mixed-use, pedestrian-friendly development around a transit station. It "is a planning and design strategy that focuses on creating urban development patterns which facilitate the use of public transit, walking and cycling, as primary modes of transport" and "is achieved by concentrating urban densities, communities and activities within a 5–10-minute walking distance from mass rapid transit stations (both bus- and rail-based)." World Bank. 2021. 2 ed. *Transit-Oriented Development Implementation Resources and Tools*. Washington, DC.

[17] Land value capture (LVC) is a public financing method by which governments trigger an increase in land values via regulatory decisions such as zoning changes or changes in floor area ratios or through infrastructure investments such as mass transit so that they can tap into the increased revenue from taxes and fees on developers and property owners and reinvest it into urban services.

schemes is complicated by the large number of stakeholders, including landholders and private investors and by insufficient coordination at the metropolitan level.[18]

13. The high cost of land and limited access to capital markets for developers and builders make it hard to expand cities by acquiring land in the periphery and to plan and implement major infrastructure projects, including slum redevelopment, within cities.[19] Financial institutions and real estate developers are deterred by the absence of clear titles. The rules and regulations for redeveloping land and property are highly nontransparent and property rights are ill-defined.[20] The absence of redevelopment and densification of available lands contributes to the shortage of housing and high prices.

14. In the past decade, the Government of India tried to respond to many of these challenges through urban rejuvenation. It launched several missions to focus on urban planning and management and to encourage state governments to empower urban local governments and build their capacities. These included the Smart Cities Mission for 100 priority cities, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) for transforming 500 cities by extending essential amenities with well-governed administration, the *Swachh Bharat Abhiyan* (Clean India Mission) aimed at ending open defecation, and the housing for all Mission (PMAY-U) to provide housing for economically weaker sections.[21] In addition, the Government of India published a National Urban Transport Policy in 2006, which advocated the integration of transport and land-use, and emphasized the use of public transport.[22] In 2017, it adopted three supplementary policies: National Transit Oriented Development Policy, Value Capture Finance Policy, and Metro Rail Policy.[23]

C. Assessment of ADB's Support

15. This evaluation assesses support by the Asian Development Bank (ADB) for water and other urban infrastructure and services (WUS) and for urban transport in India. The main objectives as detailed in the evaluation approach paper were to (i) provide ADB's Board of Directors and Management with an independent, evidence-based assessment of the sector assistance program in India from 2012 to 2022; and (ii) identify key issues from implementation experience and recommend ways for ADB to engage in the sector in India.[24]

16. ADB has supported India in addressing some of the sector challenges and has focused on the government's urban development objectives. Total financing commitments in sovereign and nonsovereign operations during 2012–2022 were $4.15 billion in the WUS sector and $2.64 billion in the urban transport sector.[25] ADB's investments were focused on infrastructure related to water supply,

[18] Apart from the coordination between the different agencies involved, there are several other challenges to the implementation of TOD and LVC. In city cores, new transits are often built along existing transport corridors to meet increasing unserved demand in the built-up areas. In the absence of appropriate zoning codes and their enforcement, these areas have high but "dispersed' densities rather than "articulated densities" built up in the precinct of transit stations, suitable for transit and land-use integration. The absence of a functioning regulatory and planning scheme for land pooling and consolidation prevents private developers from fully exploring the economic value of lands created by new transits.

[19] Government of India, MOHUA. 2017. *Public Private Partnership Models for Affordable Housing*. New Delhi.

[20] Isher Judge Ahluwalia. 2019. Urban governance in India. *Journal of Urban Affairs*. 41:1, 83-102.

[21] The 100 smart cities are intended to provide "best in class" infrastructure and smart solutions to their people, such as smart energy systems, green transportation, and smart buildings intended to save energy. The initiative aims to increase the urban share of GDP to 75% by 2030. AMRUT will provide the basic infrastructure for the 500 largest cities and towns. It will provide clean drinking water supply and improve sewerage networks and septage management systems, storm water drains, and public transport services. AMRUT will focus on the following areas: water supply, sewerage and septage management, storm water drainage to reduce flooding, nonmotorized urban transport, and green space and parks. Pradhan Mantri Awas Yojana-Urban, Smart Cities, and AMRUT.

[22] Government of India, MOHUA. 2006. *National Urban Transport Policy*. New Delhi.

[23] Government of India, MOHUA. 2017. *National Transit Oriented Development Policy; Value Capture Finance Policy Framework;* and *Metro Rail Policy Framework.* New Delhi.

[24] IED. 2023. *Evaluation Approach Paper: Sector Assistance Program Evaluation on India's Water and Other Urban Infrastructure and Services Sector (2012–2022)*. Manila: ADB.

[25] More details on the portfolio and performance of ADB's operations during 2012–2022 are in the Appendix.

sewerage, sanitation, flood protection, and solid waste infrastructure, along with institutional capacity development for project implementation. Urban transport operations focused mainly on urban rapid transit projects, including metro lines.

17. Since the findings from this sector assistance program evaluation will feed into the Independent Evaluation Department's thematic evaluation of ADB's support for livable cities and urban resilience planned for 2025, the scope was extended beyond the WUS sector to include urban transport projects, which constitute about 35% of the ADB urban portfolio in India. Although there are a few ADB interventions in India in the health sector that were explicitly tagged as urban, these were not included in the scope of the evaluation.[26]

18. The evaluation had an overarching question: To what extent has ADB's WUS program and its support for urban transport in India improved access to quality urban services, in a sustainable, resilient, and inclusive manner? The answers to three subsidiary questions will help answer the overarching question:

(i) What is the relevance and coherence of ADB's India WUS and urban transport programs with respect to ADB's strategic approach and the design of operations?
(ii) To what extent has ADB improved service quality, inclusion, resilience, gender equality, institutional capacity and efficiency, and sustainability through its operations?
(iii) To what extent has ADB facilitated greater public sector efficiency and greater private sector participation in the financing and provision of infrastructure and services through support for the enabling environment and investment opportunities?

19. The evaluation used a combination of methods, including a literature review, portfolio analysis, key informant interviews, focus group discussions, a review of best practice, and application of geographic information systems. The analysis focused mainly on the relevance, effectiveness, efficiency, and sustainability of operations completed during the evaluation period. Evidence was gathered from a review of ADB documents, including country partnership strategies, reports and recommendations of the President, project completion reports (PCRs), PCR validation reports, back-to-office reports, and midterm reviews. Key stakeholders, including ADB and government personnel, and representatives of think tanks, civil society organizations, and other development partners were interviewed to triangulate the findings. The conceptual framework for the evaluation, including the theory of change and detailed evaluation questions, was described in the evaluation approach paper (footnote 24).

20. The assessment of the portfolio's relevance is based on the extent to which operations are: (i) aligned with ADB's sector and corporate strategies as well as India's priorities; and (ii) designed to reflect good practices and innovative solutions in addressing sector challenges, with indicators that will monitor progress on financial sustainability, climate resilience, and social inclusion, in addition to indicators for service coverage and quality. Assessments were made of both internal coherence, which addresses the synergies and linkages between the interventions in different subsectors and sectors, and external coherence, which considers the consistency of the interventions with other actors' interventions in the same context. This includes the complementarity, harmonization, and coordination of ADB interventions with those of other development partners.

[26] The two health projects were (i) ADB. India. Supporting National Urban Health Mission Project; and (ii) ADB. India. Strengthening Comprehensive Primary Healthcare in Urban Areas Program Under the Pradhan Mantri Ayushman Bharat Health Infrastructure Mission.

CHAPTER 2

ADB's Program Was Relevant and Led to Progress in a Difficult Sector

21. The ADB program was generally relevant and both internally and externally coherent. ADB's WUS and urban transport portfolio addressed the complex urban sector challenges and responded well to the country's priorities and ADB's strategies. Over the evaluation period, increasing attention was paid to climate and disaster resilience, improved urban planning, and better integration of land use and transportation. The portfolio had a wide mix of subsectors, including affordable housing, and flood management projects towards the later part of the evaluation period. ADB also introduced some innovative approaches and mobilized cofinancing.

22. ADB contributed to increased household access to piped water supply and better sanitation and sewerage services, although it fell short of achieving the targeted levels of outputs and outcomes in many projects. Some projects supported improvements in the efficiency of water supply services through the introduction of water metering and reductions in nonrevenue water (NRW). ADB support for urban transport contributed to improvements in mobility and reductions in carbon dioxide emissions, and to increases in socioeconomic activities in transit catchment areas. Contributions to climate resilience and urban sustainability are expected through project components involving improving stormwater drainage, flood protection, and wastewater treatment. Targeted outcomes relating to slum upgrading were met in some projects and in some others targeted outcomes on service delivery, such as the number of urban poor having access to piped water, were achieved. Women benefited from improved access to water and sanitation; increased their awareness of water management, health and hygiene; and participated in project management and implementation.

A. ADB's Program Was Coherent and Aligned with ADB Strategy and India's Priorities

1. ADB Sector Program in India Was Aligned with ADB's Strategic Priorities

23. In line with the priorities of Strategy 2020[27] and the country partnership strategies,[28] ADB's portfolio focused on the continuing deficits in urban water supply, sanitation, flood protection and, to a lesser extent, SWM. Strategy 2020 aimed to increase investments in water supply, sanitation, and waste management systems to improve public health. The country partnership strategies emphasized improving access to clean water and sanitation services, reducing water and air pollution, and incorporating measures into the project designs for inclusive, sustainable, and resilient urbanization. In

[27] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

[28] ADB. 2009. *Country Partnership Strategy: India, 2009–2012*. Manila; ADB. 2013. *Country Partnership Strategy: India, 2013–2017*. Manila; and ADB. 2017. *Country Partnership Strategy: India, 2018–2022—Accelerating Inclusive Economic Transformation*. Manila.

line with the urban and water operational plans,[29] which emphasized improving governance and efficiency in operations, WUS project designs included measures to improve efficiency through metering of water use in specific districts to track and minimize water losses. The urban transport portfolio was aligned with ADB's Sustainable Transport Initiative which emphasizes a focus on urban transport operations and identifies key components, including public transport systems, nonmotorized transport, integrated urban transport planning, and demand management.[30]

24. Nonsovereign operations were rare during the evaluation period, despite ADB's strategic objective of promoting them. The Private Sector Operations Department, while quite active in lending to India's private infrastructure projects generally, made only one loan in the WUS sector (for working capital for a contractor). There was no engagement by ADB's Office of Markets Development and Public–Private Partnership transaction advisory unit in the India urban sector during the evaluation period, although it began its exploration process in India as a part of its "creating investable cities initiative" in 2022.[31]

2. ADB Program Was Aligned with the Priorities and Objectives of the Government

25. In line with the government's greater focus on basic urban services, the ADB portfolio was targeted at the water supply and sanitation subsector. Based on the primary subsector classification of projects, 42% of ADB WUS financing was for the water supply subsector, 17% for sewerage, 12% for flood protection, and the remainder for other subsectors, including SWM and policy and institutional capacity development (Appendix). In the urban transport subsector, ADB support reflected the demand for greater mobility in urban metropolitan areas and it approved seven investment projects, mostly metro rail and rapid rail transit. In line with the Government of India's adoption of the transit-oriented development (TOD), land value capture (LVC) schemes, and metro rail policies in 2017, ADB's support for urban mass transit projects included support for implementing TOD and increasing revenues through LVC instruments.

3. Portfolio Mix Responded to the Changing Strategic Priorities of ADB and the Government

26. During the evaluation period, the ADB portfolio increased the attention it paid to climate resilience and urban sustainability (Table 1), following the operational priority of livable cities in Strategy 2030.[32] This emphasis was also aligned with the Government of India's recognition that environmental sustainability was a key element of sustainable urbanization.[33] Until 2017, most ADB WUS projects had water supply as the primary subsector; until the second half of the evaluation period, few projects had sewerage and flood protection as primary subsectors (Figure). In 2021, the focus was on several subsectors, including urban housing and policy and institutional capacity development. Technical assistance (TA) related to urban development in India focused increasingly on climate and disaster resilience, and improved urban planning, including for better integration of land use and transportation.

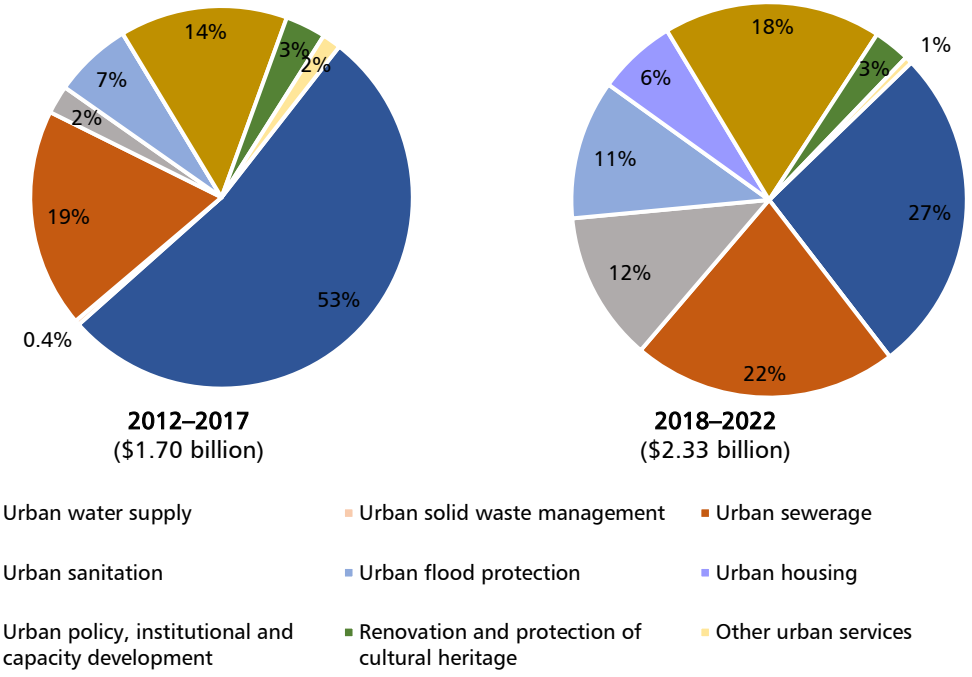
[29] ADB. 2012. *Urban Operational Plan, 2012–2020*. Manila; and ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.
[30] ADB. 2010. *Sustainable Transport Initiative*. Manila.
[31] The Creating Investable Cities initiative will support selected city governments in (i) prioritizing a pipeline of infrastructure projects and policies that improve climate resilience, (ii) identifying and implementing policies that improve local revenue mobilization and creditworthiness, and hence the attractiveness of projects oriented toward the private sector, and (iii) PPP and private sector screening of priority projects and identification of the most suitable procurement modality (public, public–private, and private) based on value-for-money considerations.
[32] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific.* Manila. The operational plan for Operational Priority 4, 2019–2024 under Strategy 2030 sets out the direction and approach for ADB to help developing member countries build livable cities that are green, competitive, inclusive, and resilient.
[33] Government of India, MOHUA. 2020. *National Urban Policy Framework, Strategic Intent*. New Delhi.

Table 1: Number of Projects Using Output and Outcome Indicators Related to Climate Resilience and Urban Sustainability in the Design and Monitoring Framework

Indicator	Approval Years	
	2012–2017	2018–2022
Reduced nonrevenue water	6	10
Reused treated wastewater	2	4
Improved flood management, reduced flood incidence, or reduced water logging	4	7
Improved solid waste collection	2	0
Rainwater harvesting	1	1
Solar photovoltaic-powered (clean energy) sewage treatment plant	0	2

Note: The total number of approvals was 22 during 2012–2017 and 20 during 2018–2022. Project readiness financing and policy-based lending are excluded.
Source: Asian Development Bank (Independent Evaluation Department).

ADB Commitments to Primary Subsectors in Water and Other Urban Infrastructure and Services, 2012–2017 and 2018–2022



ADB = Asian Development Bank.
Source: Asian Development Bank (Independent Evaluation Department).

4. Solid Waste Management and Water Resource Assessments Were Mostly Absent in the Portfolio

27. SWM has generally been omitted from the designs of WUS project loans approved in recent years, despite the high volume of untreated waste and its importance to urban sustainability and livability. One reason for this omission has been the difficult land acquisition and environmental safeguard issues for landfill development. Municipal SWM is essential for avoiding contamination of water bodies, managing flood risks, and promoting greater climate change resilience. Landfill management presents specific air, water, and soil pollution management challenges that need to be adequately assessed and addressed as appropriate. SWM, including strategies for waste segregation, reducing waste, and recycling provides the benefit of reduced methane emissions and opportunities for energy generation.

28. WUS project designs for the most part did not include a detailed needs assessment on improvements to the volume and quality of ground and surface water. Such assessments are essential for ensuring the sustainability of water resources and require the involvement of water resource specialists within ADB to assess the investment needed and potential ADB funding of that investment. For example, in 2017 ADB became aware there was insufficient raw water from Tungabhadra River in Karnataka to provide a continuous water supply to project towns during the dry season and advised the executing agency, Karnataka Urban Infrastructure Finance Corporation to reassess the bulk water requirement and availability for the entire design period of the schemes.[34] Source sustainability should have been ensured at project preparation. The sustainability of water sources is also an issue in Rajasthan, particularly in urban areas where there is an identified but unmet need for mandatory groundwater recharge structures in addition to water harvesting structures. Since water resource assessment involves both urban and rural areas at the regional level in terms of both demand requirements and supply constraints, this assessment should necessarily be carried out at the larger water basin level as well as for the city or cities of interest. Coordination between agriculture, food, nature, and rural development and water and urban development sector groups is needed.

5. Choice of Multitranche Financing Facility Was Not Always Appropriate

29. The multitranche financing facility (MFF) was the most prevalent financing modality in the India WUS sector during the evaluation period (2012–2022), but, in retrospect, MFFs should not have been implemented so extensively in the WUS sector. MFFs were considered to be appropriate modalities for efficient long-term project implementation for North Karnataka and Rajasthan. However, MFFs often have ambitious objectives that are not appropriate in states with low institutional capacity. In cases where major implementation problems were encountered, it would have been better to start with a new project with a significantly modified design rather than to move onto the next tranche of an MFF. For example, the Uttarakhand Urban Sector Development Investment Program was ineffective in achieving program outcomes and outputs as only two out of four tranches were implemented. In the North Eastern Region Capital Cities Development Investment Program, the PCR for tranche 1 noted that the project experienced multiple procurement-related delays due to the complex implementation of the MFF modality and stated that a simpler approach would have been preferable. In the second half of the evaluation period, fewer MFFs and more stand-alone projects were approved.[35]

6. ADB Program Introduced Some Innovative Design Features

30. In 2020, ADB introduced project readiness finance loans to address the issue of start-up and implementation delays. These were used in India in addition to or instead of project preparatory TA projects. Cofinancing from different sources helped introduce pioneering elements in project design in support of improving climate resilience, inclusive sanitation, and nature-based solutions. For example, a grant from the Asian Clean Energy Fund supported the development of a solar-powered municipal sewage treatment plant in Coimbatore, Tamil Nadu. A grant from the Bill and Melinda Gates Foundation financed the pilot testing of on-site sanitation options, including low-cost and environment-friendly toilets, and decentralized treatment, in non-sewered areas. A Global Environment Facility grant supported the Greater Chennai Corporation to enhance flood retention in the Kadapakkam Lake through ecosystem restoration.

31. Knowledge TA projects also helped introduce innovative elements in projects by providing technological solutions. ADB TA helped transfer technology to the Delhi Jal Board to implement a district metering approach to reduce NRW, adopt supervisory control systems, and acquire data to improve

[34] As noted in the back-to-office report of the Karnataka Integrated Urban Management Investment Program, Project 1 (Loan 3148 and Grant 0399).

[35] In urban transport, time-sliced MFF was used in Delhi–Meerut Regional Rapid Transit System and Chennai Metro projects since it was considered an appropriate modality to deal with the risk of delay and the government can avoid paying high commitment charges.

operational efficiency. In partnership with the Republic of Korea e-Asia and Knowledge Partnership Fund, ADB tapped the Korea Water Resources Corporation (K-water) to introduce high-level technology and provide training programs. In Chennai, the TA developed and proposed appropriate technology to support the Chennai Metro Water Supply and Sewerage Board in identifying and scaling up NRW management technologies.[36] TA funded by the Urban Climate Change Resilience Trust Fund supported Smart Cities Mission projects in India and strengthening of climate resilience in Tamil Nadu and Kolkata.

7. ADB Program Was Mostly Coherent Both Internally and Externally

32. There is some evidence of cross-subsector synergies in the WUS sector operations. Integrated storm water and sewerage infrastructure was constructed in the Madhya Pradesh Urban Services Improvement Project and under the Kolkata Environmental Improvement Investment Program.[37] ADB has been collaborating internally and externally to respond to the needs and priorities of the Government of India, state and municipal governments, and their transit agencies in implementing the National Urban Transport Policy. To support TOD and LVC policies, ADB has been mobilizing staff with different expertise, creating project teams that cut across sectoral boundaries, including the transport and urban divisions, India Resident Mission, and Private Sector Operations Department.

33. ADB support has generally been complementary to the support received from other development partners. Kolkata's Environmental Improvement Investment Program for sewerage and drainage in flood-prone areas followed the recommendations of a World Bank report on building Kolkata's climate change resilience. Coordination among development partners was mostly informal rather than institutionalized.[38] ADB's Chennai Integrated Urban Flood Management project benefited from (i) the World Bank's multisector water resources project, including in data management improvement, investments in supporting a resilient watershed, reforms to the state water resources policy, and a state water resources investment plan, and (ii) the Japan International Cooperation Agency technical cooperation to develop a master plan for flood control measures in Chennai. Support provided by development partners in the urban transport sector varied depending on their priorities and expertise. For instance, Japan International Cooperation Agency focused on developing master plans, conducting project feasibility and engineering studies, and making physical investments. The World Bank supported the formulation of national TOD and LVC policies.

B. ADB Was Able to Measure and Show Outcomes in Some Key Subsectors and Projects

1. Access to Water Supply and Sanitation Increased and Efficiency in Service Delivery Improved

34. ADB investments in water treatment plants, network expansion and rehabilitation, and household connections helped expand access to water supply. They also helped to extend sewage collection networks and improve sanitation facilities. From projects closed and evaluated during the evaluation period, 14 million people benefited from greater access to water supply and 6 million from greater access to sanitation. ADB projects laid 3,674 kilometers of new water supply pipelines and 1,514 kilometers of a new sewerage network.[39] ADB support helped improve the quality of service, strengthen operational efficiency, and reduce water losses. In Jammu and Kashmir, for example, the duration of the water supply increased from 2 to 8 hours per day. In Madhya Pradesh, the ADB project

[36] ADB. *Smarter Drinking Water Systems for Booming Cities*. Manila.

[37] ADB. 2018. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to India for the Madhya Pradesh Urban Services Improvement Project.* Manila; and ADB. *Periodic Financing Request Report: Kolkata Environmental Improvement Investment Program (Tranche 2) in India.* Manila.

[38] The evaluation team interviewed the staff of development partners and found that collaboration among them has been ad hoc on a project-by-project basis.

[39] More details are in Appendix, Table A7 and Table A8.

resulted in 24-hour access to water, although to a limited population of 5.6 million. In the North Karnataka project, the quality of the water met national standards 90% of the time. With respect to efficiency improvements in water distribution systems, ADB helped reduce NRW in a few projects by encouraging the use of district metering areas along with digital technologies and supervisory control and data acquisition (SCADA) systems. For example, in the Kolkata Environmental Improvement Investment Program (Tranche 2), NRW was reduced from 50% to 25%, resulting in treated water being provided to about 843,500 households for more than 12 hours per day on average.

35. In some instances, ADB support led to policy reforms, including the establishment of property tax information systems based on geographic information systems, monitoring of NRW, and use of information technology for managing water and wastewater services. In Kolkata, ADB helped to improve the property tax collection efficiency from 67% to 83%.

2. Mass Transit Project Increased Mobility and Economic Activity Around Transit Nodes

36. Through the Jaipur Metro project, ADB contributed to improved mobility, reducing time and travel costs. In addition to these direct benefits, the increase in transport services and people's expectations of economic development due to the development of metro rail system have increased the level of socioeconomic activities. An impact assessment of the ADB-financed Jaipur metro project found increases in nighttime light (NTL) intensity, a proxy for local economic activity and growth.

37. Estimates of growth in NTL intensity in three zones around the stations in the 2 years following the completion of Jaipur Metro Rail Project ranged from 13.3% to 23.1% (Table 2).[40] This indicated that the level of development and socioeconomic activities had increased near the stations. The share of growth in NTL intensity attributed to the project ranged from 55.1% to 88.1% in the three zones. The direct mobility benefits and the indirect socioeconomic impacts in the surrounding areas can be mutually reinforcing.[41]

Table 2: Increase in Nighttime Light Intensity in Three Zones, 2020–2022
(%)

Distance from the Line or Station	Difference in NTL Intensity Before and After the Project in the Catchment Area of Line 1	Difference in NTL Intensity Before and After the Project in the Control Area (Catchment Area of Planned Line 2)	Difference in Differences (Increase in NTL Attributed to the Project)	Difference in Differences as a Percentage of the Difference in NTL Intensity in the Treatment Area
0.0–0.5 km	23.1	2.7	20.3	88.1
0.5–1.0 km	19.8	3.5	16.3	82.4
1.0–1.5 km	13.3	6.0	7.3	55.1

km = kilometer, NTL = nighttime light.
Source: Asian Development Bank (Independent Evaluation Department).

[40] This was calculated using the difference-in-differences method. The analysis used the area surrounding the planned Jaipur Metro Line 2, which is located in the same urban area as a control group. Nighttime light was used as a proxy for economic activity.

[41] The project completion report found that the average daily number of passengers in the first year of operation (2020–2021) was 10,152, against the target of 126,000 in its first year of operation. The average daily ridership reached 33,175 as of May 2022. Higher ridership numbers are expected once the new Line 2 is constructed and commissioned. The impact analysis indicated that local activities and development may start right after completion or even during the construction phase, as investors anticipate the benefits that may arise from the mass transit system. This can lead to early and rapid growth in these areas, often outpacing the development of the transport infrastructure itself. Ridership, on the other hand, may take time to respond to the developments around the metro stations.

3. ADB Program Contributed to Climate Resilience and Urban Sustainability Through Project Components Aimed at Flood Control, Reductions in Water and Air Pollution, and Extending Service Access to Low-Income Areas

38. Climate finance in WUS operations during 2012–2022 amounted to $997.2 million, 61% for climate change adaptation and 39% for climate change mitigation. Most of the projects are ongoing and the final outcomes can be measured only after their completion. The ADB portfolio contributed to climate resilience and urban sustainability through project components covering wastewater treatment, improved stormwater drainage and urban flood protection. ADB contributed to the installation of channel-based drainage systems to reduce flooding and provided technical assistance to enable higher technology solutions. In Kolkata, ADB supported the successful installation of a flood forecasting and early warning system to transmit real-time status information from pumping stations, canals, roads, and vulnerable settlements. In Rajasthan, incidents of street flooding have reduced from 60 days a year to 1 day a year. ADB's WUS program contributed to water savings through NRW reduction measures in several projects and reduced contamination of water resources because of sewage treatment interventions.

39. Although contributions to climate change mitigation were not tracked in design and monitoring framework indicators in closed projects, some ongoing projects include indicators such as greenhouse gas emission reductions in their design and monitoring frameworks. Contributions to climate change mitigation in these ongoing projects are expected from, for example, avoided carbon dioxide emissions as a result of a solar-powered sewage treatment plant.[42] Climate change mitigation benefits are also expected from the use of energy-efficient pumps, energy savings from the use of gravity-based bulk water systems, methane capture through sewerage systems, energy efficiency improvements in water supply and sanitation projects, and fugitive methane emission reductions in SWM projects. The Jaipur metro rail led to a shift from private cars to public transport, reducing air pollution and lowering health costs. The PCR estimated that, over a 30-year period, the Jaipur metro project would reduce the equivalent of 3,500 tons of carbon dioxide per year in emissions.

40. The WUS program contributed to inclusive urbanization by meeting the design and monitoring framework service delivery targets in very low-income areas. Access to basic urban services (safe drinking water, hygienic sanitation, and SWM) improved for people living in slums and for people below the poverty line in selected projects. Target outputs relating to slum upgrading were mostly achieved, including piped drinking water, drains, roads, community toilets, and streetlights. A wider inclusive sanitation solution was piloted in three small to medium-sized cities in Rajasthan where private septic tanks were de-sludged for delivery to a facility where sludge is mixed with organic waste to create fertilizer.

4. Positive Impact on Women Was Evident Upon Effective Implementation of Gender Action Plans in Projects

41. The WUS projects approved during the evaluation period were all classified as effective gender mainstreaming. For the evaluated projects, the PCR validation reports indicated that the gender action plans were effectively implemented. Campaigns that accompanied the projects increased the awareness of women about water management, health and hygiene, and SWM. The participation of women in training sessions and in meetings influenced project design and outcomes. The employment of women in project management and implementation meant that women were involved in decision-making processes. Although it was not measured and monitored, better access to water supply helped women and girls spend less time on collection and management of household water needs. Women reportedly utilized the saved time for rest, leisure, domestic tasks, care work, and enhancing their skills and income.

[42] ADB. 2018. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility, Technical Assistance Grant, and Administration of Grant to India for the Tamil Nadu Urban Flagship Investment Program.* Manila.

42. Tourism projects introduced basic infrastructure such as separate toilets and bathing facilities for men and women, health services, and child care. Lighting, closed-circuit television cameras, and helpline numbers for improving women's safety were introduced. Gender equity measures and universal designs in the urban transport projects helped to foster more socially inclusive cities and to empower socially and economically weak urban populations. In the Jaipur metro project, the stations were constructed with dedicated facilities for women, the elderly, children, and people with disabilities.

5. Contribution to Institutional Capacity Improvements is Seen Where ADB Had Long-Term Engagement with States

43. Institutional capacity improvements are evident in the states and cities where ADB had long-term involvement, e.g., Karnataka, Rajasthan, and Kolkata. Capacity was strengthened in project and financial management, procurement, gender mainstreaming, and implementation of social and environmental safeguards. The Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation, an autonomous umbrella organization, was created in 2015 to manage projects in more than 60 small to medium-sized cities with limited capacity for implementation. In Karnataka, the institutional capacity of the Karnataka Urban Infrastructure Development and Finance Corporation improved, and it became the primary state agency for all externally aided urban projects and urban sector projects funded by the central government. In Kolkata, ADB projects enhanced flood forecasting and increased use of smart technologies for NRW reduction. However, the capacities of ULBs for O&M and cost recovery were generally weak. Institutional capacity improvements can be expected in future in Tamil Nadu through the newly formed Project Management and Design Center under the ongoing Tamil Nadu Urban Flagship Investment Program and the building of flood control capacity under the ongoing Integrated Flood Management Project.

6. Private Sector Participation Was Encouraged in Some Sovereign Operations

44. Sovereign lending encouraged private sector participation in anticipation of greater efficiency in the provision of urban infrastructure and services. Engineering procurement and construction contractors took on an O&M role for 5–10 years as a condition of their construction contracts. ADB encouraged the use of performance indicators and targets, including increases in the number of hours of continuous water supply per day and reductions in NRW to ensure more sustainable outcomes. Within the evaluation period, O&M contracts were expanded to include timely construction and accurate budgets via design–build–operate contracts. These provided for a seamless transition from construction to operation. ADB sovereign lending also encouraged private developers to construct housing units to house relocated slum dwellers by financing co-investment with private developers under the Tamil Nadu Housing and Habitat Development Project.

CHAPTER 3

ADB Projects Face Substantial Performance Challenges

45. As discussed in Chapter 2, ADB's assistance was generally relevant. The project mix in the portfolio was aligned with ADB's strategic priorities, and project designs were appropriate for achieving the objectives. The portfolio also contributed to sector results in terms of expanding access to urban services and some efficiency and service quality improvements. However, the performance of ADB's operations was weak and encountered substantial implementation challenges. These weaknesses are evident from the closed and evaluated projects during the evaluation period. Although ADB's support contributed to development results, project performance with respect to achieving the targeted levels of outcomes and outputs, i.e., the effectiveness of the projects, was low. The financial sustainability of projects was problematic, and most had lengthy start-up periods, causing subsequent implementation delays. ADB has been taking some positive steps to address these challenges, the impacts of which may be reflected in future assessments or project completion reports.

46. Several issues need to be addressed to improve performance. Project designs were not always based on holistic and integrated planning and citywide approaches. If they had been, they could have enabled synergies from cross-sector coordination and enhanced urban resilience and sustainability. Greater effort will be needed to scale up innovations and good practices so they can produce a transformative impact. Local bodies were not sufficiently incentivized to undertake reforms to strengthen their financial sustainability or to build their capacities. While ADB has aligned its requirements to India's stringent project readiness checklist, further strengthening may be needed to suit individual WUS projects. Lack of basic pre-investment planning for multimodal transport integration and mixed-use high-density development around transit nodes prevented potential benefits from transit infrastructure from being fully realized. Urban sector operations did not adequately strengthen the enabling environment or help make projects attractive for private investment.

A. ADB's Operations Had Weak Performance Ratings

1. Overall Success Rate of WUS Operations Was Lower Than Those for Other Sectors

47. Completion and validation reports for closed projects found that ADB's WUS sector portfolio had a project success rate of only 20%.[43] By contrast, the transport and energy sectors in India had success rates above 80%. When broken down by evaluation criteria, the program was weakest for effectiveness and sustainability. Most projects were rated relevant, given their overall design appropriateness and alignment with the strategic priorities and objectives of India and ADB. The reasons for the weak performance of WUS sector operations included failure to achieve targeted outcomes and weak financial sustainability arising from low-cost recovery and weak institutional capacity of local authorities, which were also elaborated in earlier evaluations, the country partnership strategy final review,[44] and its

[43] See Appendix for more details on performance.
[44] ADB. 2022. *Country Partnership Strategy Final Review: India, 2016–2021.* Manila.

validation report by the Independent Evaluation Department (IED),[45] the evaluation of ADB's Water Sector Policy and Program,[46] and the country assistance program evaluation.[47]

48. Jaipur metro, the only ADB urban transport project evaluated during the evaluation period, was assessed less than successful. The realized ridership was 33,175 passengers per day compared to the expected 126,000. This shortfall affected cost-efficiency and threatened the financial sustainability of the project. The revenue generated from the passengers was not sufficient to cover O&M costs or to repay the loan. However, the transit agency expected that ridership would increase in future when complementary investments, including the second metro line and the bus rapid transit system, are made and when the TOD and multimodal integration measures are implemented.

2. Effectiveness of WUS Projects Was Low

49. Many of the projects could not deliver fully on the targeted outputs and outcomes and very few were rated effective in achieving outputs and outcomes.[48] Only 33% of projects were rated effective. While the achievement of output targets was high for a few projects, generally it was 50% or lower. Limited ADB involvement in project design development was a key reason for project components being dropped during implementation. Target indicators were based on preliminary designs and were unrealistic, affecting the achievement of targets. The final review of the country partnership strategy, 2016–2021 noted that improvements had been made in the ongoing projects based on lessons learned, including revisions to design and monitoring framework indicators and targets after minor scope changes. It noted that better performance could be expected from ongoing projects.[49]

50. In general, piped water supply and drainage projects had the best achievements. Sewage collection systems suffered from the poor implementation of operations at treatment plants. Large-scale sewage treatment plant projects were often cancelled because they were unable to acquire new sites. For the most part, components related to solid waste collection and transportation achieved satisfactory results. By contrast, larger new landfill projects often did not proceed due to land acquisition or use impediments or an inability to meet environmental safeguard standards.[50] Discussions with development partners indicated that focusing on remediating existing dumpsites would be more realistic for experienced private sector operators than opening new landfills. ADB has experience with the successful expansion of existing landfills, for instance, in Jammu and Kashmir. Recent ADB project loans have not included any SWM component, due in part to this landfill issue.

3. Project Financial Sustainability Was Especially Problematic

51. Performance with respect to sustainability was the weakest, with very few of the projects rated likely sustainable by PCR validation reports.[51] The weak financial sustainability of water supply and sewerage projects was caused by the inadequate capacity of ULBs in O&M of the facilities. ADB's capacity building support was unable to help ULBs to raise tariffs enough even to keep up with inflation. Revisions to water tariffs were infrequent. In North Karnataka State, as reported in 2022, the most recent water rate increase had occurred in 2011. Collection efficiency was poor, even when household water connections were metered.[52] Projects generally lacked an analysis of the ULBs' ability or willingness to

[45] IED. 2023. *Country Partnership Strategy Final Review Validation: India, 2016–2021*. Manila: ADB.
[46] IED. 2022. *Sector-Wide Evaluation: Integrated Water Management: Evaluation of ADB's Water Sector Policy and Program, 2011–2021.* Manila: ADB.
[47] IED. 2017. *Country Assistance Program Evaluation: India, 2007–2015.* Manila: ADB.
[48] See Appendix, Table A9.
[49] ADB. 2022. *Country Partnership Strategy Final Review: India, 2016–2021*. Manila.
[50] See Appendix, Table A10.
[51] See Appendix, Tables A6 and A11.
[52] While ADB-funded projects require the installation of water meters, in one case (Tripura), the field validation found that the meters were located on the household property land, making access for the physical reading of meters difficult. No meters were being read as community opposition to water meter reading persists, and the political will to develop and introduce a socially acceptable water tariff is lacking (North Eastern Region Capital Cities Development Investment Program).

devote funds to O&M. O&M cost recovery indicators were not included in the design and monitoring framework.

52. Since water is partly a public good and there are positive health externalities from the supply of clean drinking water and sewerage and sewage treatment, state governments usually provide large subsidies for capital cost recovery and play a strong role in project implementation. However, funding and technical implementation of O&M is typically handled at the ULB level, and ULBs should be financially self-sustaining, with little or no reliance on state government subsidies. Thus, all three revenue sources are important for financial sustainability: tariffs, taxes dedicated for O&M, and budget transfers for capital cost recovery. However, the ULBs were generally unable to raise significant revenues from their own tax sources even for O&M costs and depended heavily on government transfers, which were not always reliable.[53] Improving operational efficiency (e.g., by reducing NRW) and lowering operating costs (e.g., by increasing energy efficiency in water projects) would improve ULBs' financial sustainability. For non-revenue generating projects such as the stormwater drainage projects, financial sustainability will depend on generating adequate tax revenues and earmarking budget allocations for O&M of channels.

53. Some developments during the evaluation period can provide a platform for greater project sustainability in future. For instance, in the Rajasthan Urban Sector Development Investment Program, the institutional financial reform agenda included tariff increases and imposing service charges or property taxes to achieve cost recovery. The project in North Karnataka focused on institutional property tax reforms. However, earmarking of tax revenues would be needed to ensure funds are devoted to O&M. Only in Kolkata was a fixed percentage (30%) of property tax revenues formally dedicated to WUS.

4. Projects Experienced Frequent Implementation Delays

54. Long start-up delays were associated with obtaining licenses and permits from central and local government authorities, including approvals for project construction works and for land acquisition. Much of this should have been undertaken during the loan preparation period. Most borrowers experienced at least some implementation delays, in part due to a failure to resolve project start-up issues at the front end of the project and ineffective management of construction contractors. To address these delays, ADB recently pioneered the project readiness financing facility for some smaller projects in northeast India: Agartala (2022), Nagaland (2022), and Tripura (2020).[54] In 2018, ADB began extensive use of advance contracting in the India WUS sector, but it is too early to assess the impact of this strategy on project implementation time or on the quality of works.

B. Issues to be Addressed to Improve Performance and Produce Better Development Results

1. Projects Were Not Always Designed to Harness Synergies Through Cross-Sectoral Coordination

55. A few WUS projects adopted a citywide integrated planning approach to urban development, including natural resource management, based on comprehensive diagnostic studies and with a focus on broader urban climate resilience and sustainability. Core infrastructure improvement projects are missing the opportunity to capture synergies from key links with other sector interventions by supporting these with additional ADB actions when appropriate.

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[53] The unreliability of transfers from the state government to the ULBs is discussed in Chapter 1 under sector challenges. Issues with the predictability of transfers from state governments to ULBs has been noted in the literature, e.g., Isher Judge Ahluwalia. 2019. Urban governance in India. *Journal of Urban Affairs*. 41:1, 83–102.

[54] ADB. 2022. *Project Readiness Financing Report: Agartala Municipal Infrastructure Development Project in India*. Manila; ADB. 2022. *Project Readiness Financing Report: Nagaland Urban Infrastructure Development Project in India*. Manila; and ADB. 2020. *Project Readiness Financing Report: Tripura Urban and Tourism Development Project in India*. Manila.

56. The WUS sector has potential for strong cross-subsector synergies. For example, it is optimal for storm sewer construction to be coordinated with sewage collection and treatment projects to reduce the volume of stormwater that might otherwise leak into the sewerage system and overload it, which would add significantly to operating costs by requiring unnecessary treatment. Projects approved more recently had some integrated elements, e.g., the integrated urban flood management project in Chennai. Sewers and drainage were built together in flood-prone areas of Kolkata under the Kolkata Environmental Improvement Investment Program. Sewerage and storm sewers are scheduled to be built together in the Agartala City Smart City Urban Development Project in Tripura State. Under the Madhya Pradesh Urban Services Improvement Project, integrated storm water and sewerage infrastructure was constructed in two tourist towns.

57. Water availability is critical to both water quantity and quality, but it is not being adequately addressed through integrated WUS projects. India's water availability is worsening; it has only 4% of the world's freshwater resources for 17% of the world's population. A water resource assessment should be a mandatory part of project preparation and investment targeting, since in some parts of India the supply of piped water has been reduced to a few hours in a day.[55] There is a need to quantify how much sewage treatment can lower the actual or potential risk of water resource contamination. Proactive drought management in Northeast Brazil has shown how a combination of regional and municipal or urban water resource management plans can integrate adequacy assessments of surface and ground water resource volume and conservation requirements at the city or metropolitan level.[56] This requires a certain degree of cross-jurisdictional information-sharing, cooperation, and coordination.

58. Not all urban transit projects considered how transport and land use could be integrated or non-fare revenue increased to improve the financial viability of the project. The PCR of the Jaipur Metro Project reported that careful consideration of last-mile connectivity solutions, improved signs around stations, and TOD measures were needed to realize project outcomes.[57] TOD and multimodal integration measures have been considered in the later ADB-assisted Delhi–Meerut Regional Rapid Transit System project, and the metro rail projects in Bengaluru and Chennai.

2. Adoption and Scaling Up of Innovations and Good Practices Need to be Mainstreamed

59. While ADB has recently in 2021 taken steps to identify project design innovations and good practices for replication in future projects, more can be done to accelerate the scaling up process countrywide. ADB finance is limited ($0.38 billion a year) compared with the average annual capital expenditure of $15 billion by central and state governments for the period financial years 2021–2025.[58] It needs to leverage its limited financing to obtain maximum impact by supporting critical reform measures and scaling up good practices. ADB introduced innovative elements in many projects to ensure cities had greater climate resilience. For example, the Kolkata TA project for a Flood Forecasting and Early Warning System provided technology for transmitting real-time status information from pumping stations, canals, roads, and vulnerable settlements. Kolkata is actively sharing its technology transfer experience with other cities in West Bengal. While intrastate knowledge sharing is useful, it needs to be extended countrywide. Apart from developing knowledge products and organizing workshop and events, ADB needs to support stronger ULBs to support weaker ULBs to adopt good practices and increase operational efficiency.[59]

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[55] The importance of taking an integrated approach to water resource management and carrying out water assessments is covered in an earlier. IED evaluation. IED. 2022. *Sector-Wide Evaluation: Integrated Water Management—Evaluation of ADB's Water Sector Policy and Program, 2011–2021*. Manila: ADB.

[56] E. De Nys, N.L. Engle, and A. Rocha Magalhães. 2017. *Drought in Brazil: Proactive Management and Policy.* Baton Rouge, Florida: CRC Press (Chapters 5, 6, and 12).

[57] ADB. 2023. *Completion Report: Jaipur Metro Rail Line 1–Phase B Project in India.* Manila.

[58] ADB. 2023. *Country Partnership Strategy: India, 2023–2027—Catalyze Robust, Climate-Resilient, and Inclusive Growth.* Manila.

[59] ADB. 2014. *Water Operators Partnerships: Twinning Utilities for Better Services*. Manila.

60. In a limited number of ADB projects, the executing and/or implementing agencies significantly improved their performance over time in both the speed and the quality of project execution. This improvement provides a good foundation for the introduction of innovations and at least some of these achievements should be replicable and transferable to states that are performing less well. For example, Karnataka introduced community awareness campaigns which motivated families to invest in better household hygiene. It achieved high ownership in the community by addressing stakeholders' concerns about metering and volumetric tariffs and explaining their importance in providing better services by minimizing water losses. Other examples of good practices for replication include using district-metered areas and digitizing maintenance systems and solid waste segregation at the customer level (as the Kolkata Municipal Corporation did), and implementing a computerized customer data base, ring-fenced water accounting, and monitoring (as in Karnataka).[60]

3. Project Designs Did Not Sufficiently Encourage Capacity Development or Policy Reform

61. ADB had limited success in transforming WUS sector governance using capacity building technical assistance together with project lending. It found it difficult to influence policy reforms directly or to build institutional capacity. A WUS-related policy-based loan approved in 2021 provided budget support to the central government and supported the implementation of a series of policy actions and national and subnational reforms that are crucial to structural urban reforms linked to water supply and sanitation, affordable housing, and mainstreaming performance-linked funding for urban service delivery.[61] While the policy-based lending supported the development of policy guidelines and preparation of water action plans, the financially weaker ULBs are looking for additional resources for investments; they could be incentivized by linking investment funding to the implementation of critical reforms. Results-based lending links disbursements to the achievement of capacity or policy reform-related indicators by the executing and implementing agencies. For example, a World Bank project in Chennai used policy-reform-related disbursement indicators.[62] ADB approved a results-based lending program in the electricity sector where the disbursement-linked indicators included metering and billing of customers and the reliability and quality of power distribution.[63] The state government of Karnataka has used its ULB Incentive Fund programs to motivate ULBs to implement reforms, e.g., by enforcing water tariffs and improving collection efficiency following a clear timeline, and to become efficient and responsive municipal service providers.[64] These incentive funds were used in the project towns under the Karnataka Integrated Urban Water Management Investment Program.[65]

4. Poor Project Readiness Resulted in Project Implementation Delays

62. In the closed and evaluated projects, implementation was often affected by inadequate project readiness, which was compounded by the limited capacity of implementing agencies and their project implementation units, particularly at the local government level. At the outset of projects, basic project fundamentals such as approvals and site control and/or land acquisition had not been undertaken and this led to project implementation delays. Many WUS projects fell behind schedule by several years during the start-up period and executing agencies were unable to recover in time to reach physical completion before loan closure, even when ADB had agreed to an extension. At the close of ADB financing, there

[60] The district metering areas approach entails risks and challenges that agencies and ULBs with limited capacity may not be able to cope with. The approach should be undertaken selectively. Risk assessments should be carried out to determine whether it is suitable for a particular water supply system.

[61] ADB. 2021. *Report and Recommendation of the President to the Board of Directors: Proposed Programmatic Approach and Policy Based Loan for Subprogram 1 and Technical Assistance Grant to India for the Sustainable Urban Development and Service Delivery Program.* Manila.

[62] World Bank. 2021. *Chennai City Partnership: Sustainable Urban Services Program (P175221): Program-for-Results*. Washington, DC.

[63] ADB. 2020. *Report and Recommendation of the President to the Board of Directors: Proposed Results-Based Loan and Technical Assistance Grant to India for the Maharashtra Rural High Voltage Distribution System Expansion Program.* Manila.

[64] ADB. 2020. *25 Years of Partnership with Karnataka: Evolving Model for Sustainable Urban Water Service Delivery.* Manila.

[65] ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to India for the Karnataka Integrated Urban Water Management Investment Program.* Manila.

were often major shortfalls in project outputs and outcomes which meant that the host government had to finish projects using its own funds but without the benefit of full ADB oversight or support. To address the issue of start-up delays, the current project readiness checklist requires that 30% of procurement contracts should have been bid out and awarded prior to loan negotiations. Progress made with advance contracting, while still too early to assess, would work best if project readiness criteria were expanded to address the concrete circumstances related to the start-up of each project.

63. The South Asia Department has now aligned its processes to India's stringent project readiness checklist, but further strengthening is needed to suit individual WUS projects. The long start-up periods that were needed to address fundamental aspects of project implementation suggest that it may be necessary for ADB to increase its requirements. There is a clear need for additional requirements such as ULB and/or state level permits and licenses, expanding land acquisition requirements beyond the aggregate 50% target (set within the current project readiness guidelines) to include all land identified as critical to progress early-stage project implementation, and agreeing on the new project implementation staff qualifications and the timing of their hiring. To avoid a one-size-fits-all approach for local projects, additional project specific readiness items may be considered on an as needed basis. On a separate matter, ADB typically assigns different staff to lead loan processing and loan implementation, which may not be an ideal arrangement in terms of incentives to avoid delay in addressing problems until implementation stage.

64. Karnataka and Rajasthan did improve their project readiness performance over time. The Karnataka Integrated Water Investment Project, for example, started with high procurement readiness (with more than 50% of contracts awarded at approval) and all contracts were awarded during the first year of implementation. Rajasthan's performance was good at the state level but ULBs remained weak. Rajasthan significantly strengthened its institutional capacities to plan and prepare the feasibility documents of the subprojects, procurement, contract management, safeguards, and monitoring at the state level.

5. Timely Land Use Planning is Needed to Optimize Transit Infrastructure

65. Different timelines are often used to (i) construct a transit system and make efforts to integrate different modes of transportation (multimodal integration) in a seamless way, and (ii) build compact mixed-use higher density development around transit facilities. Work on these latter measures needs to be substantially advanced before the transit infrastructure is completed if a city is to reap the full benefits of a transit system. This was not the case in the Bangalore and the Chennai Metro projects since the detailed designs of the station facilities were well advanced at the time of project approval. This made it difficult to adopt the suggestions for revisions to the designs of transit station facilities that were made by studies supported by TA. To benefit from the full potential of transit infrastructure investments, ADB needs to ensure that state governments undertake critical enabling actions, such as adopting a zoning code for TOD, and carrying out the necessary planning, legislative and regulatory measures, at the time of project approval.

6. A Weak Enabling Environment Affected Private Sector Investments

66. There is potential for private sector investments in WUS and urban transport, but insufficient attention has been paid to developing the enabling environment, especially to ensuring a dependable revenue stream from end-user tariffs or from other tax and nontax sources. Concern about revenues was the main reason for the low volume of private investments in the WUS sector and may have been why ADB did not pursue opportunities to support the major effort being made by the Rajasthan government to develop wastewater reuse projects under PPP or other modalities. Major efforts are needed to structure attractive interventions that can, for example, incentivize developer investment in affordable housing, and foster upstream development of PPP projects in urban transportation and SWM.

67. The lack of nonsovereign operations in the metro rail sector was primarily due to the low profitability of rail transit investments. High upfront capital investment costs and government regulations that set fares below full economic cost recovery levels to keep them affordable resulted in a low return on equity. Moreover, private investors must bear construction risks, including those associated with procuring rights of way in densely populated urban areas in a timely manner by governments, and the commercial risk associated with estimates of ridership demand, which is often shared with the public sector.

7. ADB Has Paid Inadequate Attention to Attracting Private Sector Capital for Urban Infrastructure

68. Municipal bonds and/or loans remain an untapped source of financing of municipal infrastructure in India. City municipalities have inadequate capacity for the financial management, design, and implementation of investment programs and there is potential for ADB to help remedy this and to improve municipalities' medium- to long-term creditworthiness. India has well-regarded domestic rating agencies that provide a broad system of credit ratings for local governments. In the longer term, ADB may choose to pursue direct lending or to guarantee options for municipal finance and/or to finance PPP projects where a local government entity would be the principal source of tariff payments.

CHAPTER 4
Way Forward

69. The evaluation offers five recommendations for ADB so it can address the issues that are affecting performance and increase the development impact from its operations in the urban sector.

70. **Recommendation 1. ADB should strengthen its comprehensive approach and adopt integrated planning and coordinated implementation in urban development and municipal service provision.** It should aim to harness synergies between different subsector interventions, with a particular focus on integrating (i) water resources management with urban water supply and sanitation, (ii) water supply and sanitation with wastewater recycling, (iii) SWM with sewerage and stormwater drainage, and (iv) transit-oriented development with transport infrastructure investments. Assessments of the adequacy of surface and ground water resources and measures to conserve water should be integrated into the design and preparation of water treatment and water supply projects. This will require coordination between the agriculture, food, nature, and rural development and water and urban development sector groups. Going beyond support for knowledge work, transit-oriented development, including land value capture, needs to be integrated into urban transport infrastructure project design and development. Since such projects require expertise in numerous areas, including urban transport, planning, and commercial real estate, a multisector approach should be adopted with appropriate institutional arrangements depending on the required ADB support as identified in sector assessments and road maps of development. Formal internal arrangements to enable inter-sectoral collaboration will be needed.

71. **Recommendation 2. ADB should continue to take measures to reduce delays and improve the quality of implementation.** ADB should continue recent steps to use advance contracting. It should revisit the scope of actions to be completed under the existing project readiness checklist. For example, it would be useful to require that 100% of a site needs to be acquired in the case of landfills as opposed to the 50% land acquisition requirement in the current checklist. ADB should also ensure that the loan approval team stays engaged in the early stages of project implementation so the loan design can relate well to start-up activities.

72. **Recommendation 3. ADB needs to accelerate knowledge exchange and incentive mechanisms for successful project implementation practices across states and cities in India.** ADB project teams need to facilitate knowledge transfer during the project design phase through meetings among ULBs and utilities. ADB should provide stronger support during the implementation process. Alternative lending modalities, e.g., results-based lending and sector development programs, should be explored to incentivize executing and implementing agencies to adopt good practices in institutional capacity development and governance improvement and to perform better against subsector performance indicators. This way, ADB can leverage its limited financing for transformational change.

73. **Recommendation 4. ADB should stay engaged in the full cycle of solid waste management services, including implementation of landfill projects, given the importance of such services in ensuring urban sustainability and livability.** It should address land acquisition and other issues relating to past failures to implement landfill projects and change project designs to focus on existing landfills rather than on new landfill sites. It should outsource reconstruction and operation to the private sector. Financing this critical infrastructure would provide an opportunity for ADB to facilitate improvements in the upstream collection and recycling process as well. Resolving the land acquisition issue for landfills in one or two pilot projects may be advisable to enable ADB to re-enter the sector. ADB can learn from the experience of successful expansion of existing landfills, for instance, in Jammu and Kashmir. ADB should include

SWM components in urban flood management projects to address the indiscriminate dumping of solid waste and its impact on urban flooding.

74. **Recommendation 5. ADB should enhance its upstream policy and regulatory analytical work to strengthen the private sector enabling environment and to enable adequate and reliable revenue streams.** It should identify areas that could ultimately generate private sector projects. This strategy could include (i) bolstering the creditworthiness or municipal borrowing capacity of large cities in the bond market and the local bank borrowing market through support for mobilizing revenues from user charges and property taxes, improving financial reporting procedures and instituting capital budgeting systems; (ii) supporting the development of commercial aspects of transit-oriented development and land value capture; (iii) developing a commercially viable wastewater reuse PPP pilot project structure that takes account of key factors such as the creditworthiness of targeted industrial and agricultural customers and cost-effective transport of sewage between customer locations and the treatment plant; and (iv) including affordable housing projects in the PPP project pipeline, together with government subsidies to ensure financial viability and attract experienced developers and investors. ADB should build on its experience in these areas and leverage the lessons learned.

Appendix

PORTFOLIO ANALYSIS, PERFORMANCE, AND RESULTS

A. ADB Support for India, 2012–2022

1. **Sovereign and nonsovereign loans.** Total financing commitments in sovereign and nonsovereign operations during 2012–2022 were $4.152 billion in the water and other urban infrastructure and services (WUS) sector and $2.637 billion in the urban transport sector. Nonsovereign operations in the WUS sector accounted for $106 million, 2.6% of the total WUS investment. Nonsovereign operations in the urban transport sector accounted for $71 million (2.7%).

2. India accounted for 27% of the total Asian Development Bank (ADB) sovereign financial commitments in the WUS sector of $14.9 billion during the evaluation period. In urban transport, it accounted for 39% of the total ADB sovereign commitments of $6.6 billion (Table A1).

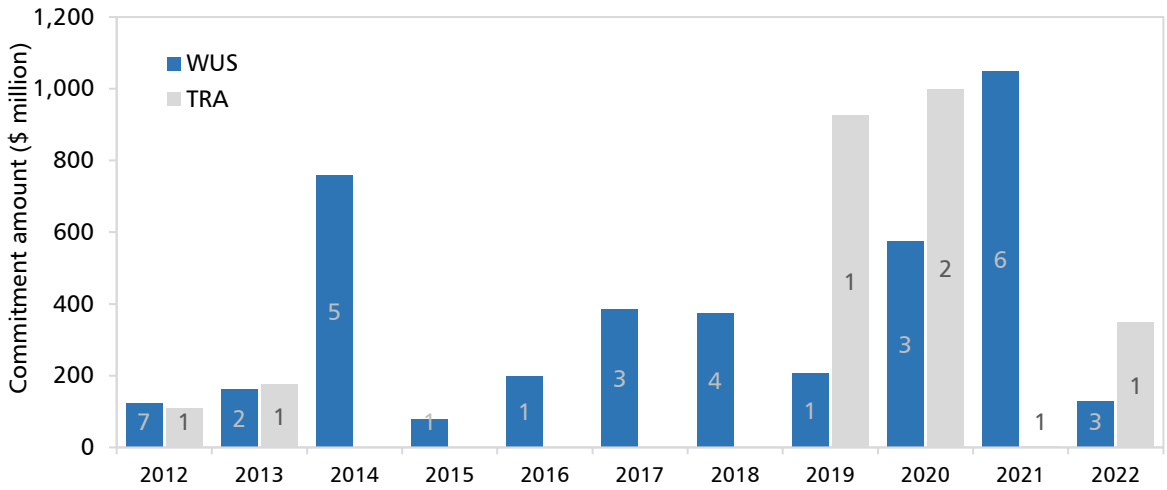
Table A1: ADB's Sovereign Financing Commitments in the Water and Other Urban Infrastructure and Services Sector and the Urban Transport Sector, 2012–2022

Year	India ($ million)	All Developing Member Countries ($ million)	Share of India (%)
WUS	4,046.06	14,920.64	27.0
Urban transport	2,566.50	6,579.57	39.0
Total	**6,612.56**	**21,500.21**	**31.0**

ADB = Asian Development Bank, WUS = water and other urban infrastructure and services.
Source: Asian Development Bank.

3. Financing amounts for sovereign operations in WUS varied over the years, with an annual average of $368 million spread over 31 loans during the 11-year period (Figure A1). Commitments to the urban transport sector averaged $233 million annually and were spread over seven loans.

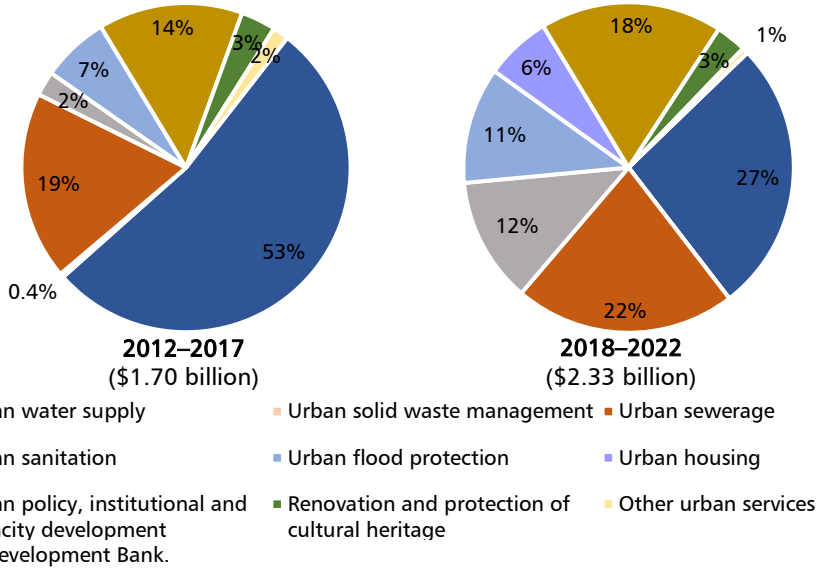
Figure A1: ADB's Annual Commitments to India's WUS and Urban Transport Sectors, 2012–2022



ADB = Asian Development Bank, TRA = urban transport, WUS = water and other urban infrastructure and services.
Note: Numbers inside the chart denote the number of loans.
Source: Asian Development Bank.

4. ADB support to the WUS sector increased by 37% from $1.7 billion in 2012–2017 to more than $2.3 billion in 2018–2022 (Figure A2). The allocation to the urban water supply subsector was the highest in both periods, although, as a share of the total, it was reduced by almost half in 2018–2022. ADB commitments to the other subsectors increased substantially, with commitments for urban sanitation increasing sevenfold, from $40.8 million to $285.1 million.

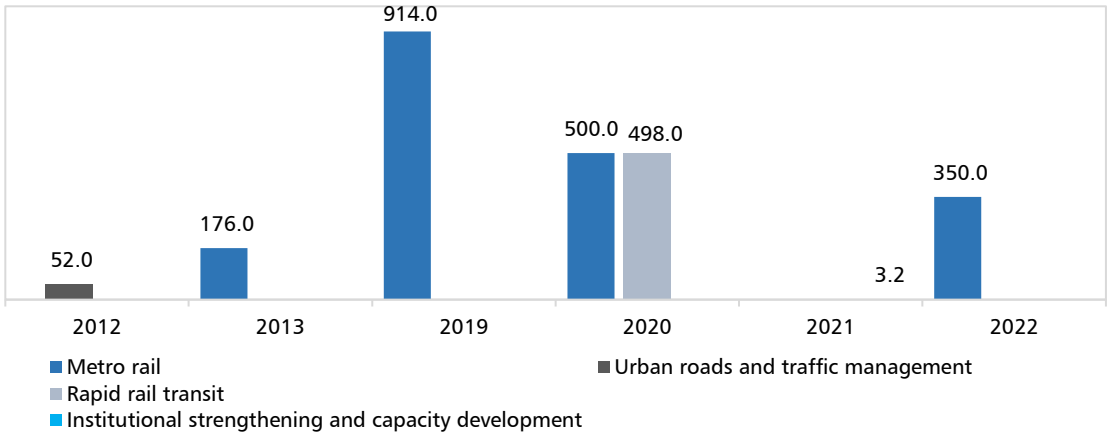
Figure A2: ADB Commitments to Primary Subsectors in Water and Other Urban Infrastructure and Services, 2012–2017 and 2018–2022



ADB = Asian Development Bank.
Source: ADB (Independent Evaluation Department).

5. In the urban transport sector, most of the commitments were to the urban public transport subsector (Figure A3). A total of $2.4 billion was provided, which accounted for 98% of total development assistance for the sector during the period. Of this amount, $52.0 million was provided for urban roads and traffic management purposes.

Figure A3: ADB Annual Commitments to the Main Urban Transport Subsectors, 2012–2022
($ million)



ADB = Asian Development Bank.
Source: ADB (Independent Evaluation Department).

6. **Technical assistance.** Total funding for technical assistance (TA) operations (WUS and urban transport) amounted to $41.7 million. This was broken down into $34.5 million for WUS, spread over 28 TA operations, and $7.2 million to urban transport in five TA operations (Table A2). For WUS, there were 14 transaction technical assistance (TRTA) operations, four knowledge and support TA operations, and five each for capacity development and project preparation. For urban transport, there were four TRTA projects and one capacity development TA. Funding for the TRTA projects totaled $27.3 million, or 65% of the total TA portfolio. These projects were mostly aimed at strengthening and/or enhancing institutional capacities for the delivery of urban services (3), improvement of urban governance (2), and climate resilience (3). WUS TA operations marked as knowledge and support TA provided knowledge solutions for high-impact projects, strengthening of a regional plan, and improving urban planning through the use of smart technology.

Table A2: Technical Assistance by Type, 2012–2022

Sector	CDTA	KSTA	PPTA	TRTA	Total
WUS					
Number	5	4	5	14	28
Amount ($ million)	6.130	3.370	4.660	20.330	34.490
Urban transport					
Number	1	0	0	4	5
Amount ($ million)	0.225	0	0	7.000	7.230

CDTA = capacity development technical assistance, KSTA = knowledge and support technical assistance, PPTA = project preparatory technical assistance, TRTA = transaction technical assistance, WUS = water and other urban infrastructure and services.
Source: Asian Development Bank.

B. Performance and Results

7. Fifteen closed WUS projects in 2012–2020 were validated by the Independent Evaluation Department (IED) through project completion report (PCR) validations and project performance evaluation reports. No urban transport projects were validated. Overall, three projects were assessed successful, with 12 projects considered less than successful (20% success rate). Two of the 15 projects were approved during the evaluation period, and both were assessed less than successful. ADB's WUS sector portfolio performance in India has been weak compared with the performance in other infrastructure sectors (Table A3). To some extent this is true for all other DMCs as well. However, the WUS sector performance in India was much lower than those in other DMCs, although most projects were rated relevant given their alignment with the strategic priorities and objectives of both India and ADB and the appropriateness of the design for the purpose at hand (Table A4).

Table A3: Success Rates for Infrastructure Projects in India Compared with All Other Developing Member Countries, 2012–2022 (%)

Sector	India	All Other DMCs
Agriculture and natural resources and rural development	60	74
Energy	85	77
Transport	82	65
Water and other urban infrastructure and services	20	65

DMC = developing member country.
Source: Asian Development Bank.

Table A4: Performance of WUS Projects by Different Evaluation Criteria in India and All Other Developing Member Countries, 2012–2022

Percent of Projects Rated	India	All Other DMCs
Relevant	80	85
Efficient	60	67
Effective	33	67
Likely sustainable	7	53
Overall successful	20	65

DMC = developing member country, WUS = water and other urban infrastructure and services.
Source: Asian Development Bank.

8. Performance, when broken down by evaluation criteria, shows that 80% were rated relevant, 60% efficient, 33% effective, and 7% likely sustainable. There was a large variance in ratings between the self-evaluation and independent assessment for all evaluation criteria, particularly for project effectiveness and sustainability. Of the 11 WUS projects assessed successful in project completion reports, independent evaluations assessed 8 less than successful (Table A5). The largest differences were in the sustainability and effectiveness of projects. While PCRs tended to consider the projects sustainable based on assurances from the government on budget transfers, IED mainly considered the efforts made in mobilizing tariff and tax revenues by the local bodies since it regarded the budget transfers as unreliable (Table A6). In the case of effectiveness, one of the reasons for the difference in the ratings was that PCRs considered the output achievements made after loan closure and supported by government financing whereas IED considered only the achievements at the time of project closure.[1]

Table A5: Performance Ratings of WUS Projects by Evaluation Criteria, 2012–2022

Percent of Projects Rated	Project Completion Report (%)	PCR Validation Report (%)
Overall Successful	73.0	20.0
Relevant	100.0	80.0
Effective	60.0	33.0
Efficient	80.0	60.0
Likely Sustainable	87.0	7.0

PCR = project completion report, WUS = water and other urban infrastructure and services.
Source: Asian Development Bank (Independent Evaluation Department).

Table A6: Variance in Sustainability Ratings

Loan No.	Project Title	PCR Rating	PVR Rating	Reason for Disagreement and/or Comments
2528	North Eastern Region Capital Cities Development Investment Program (Project 1)	Likely sustainable	Less than likely sustainable	Not enough evidence to suggest sufficient funds will be available to meet O&M costs. The financial action plan was not implemented to help achieve cost recovery.
1647	Rajasthan Urban Infrastructure Development Project	Likely sustainable	Likely sustainable	The PVR noted that the government is demonstrably supporting the sustainability of the project outcomes and that there is potential for eventual cost recovery, hence the likely sustainable rating.
2676	Infrastructure Development Investment Program for Tourism (Tranche 1)	Likely sustainable	Less than likely sustainable	Lack of evidence that O&M obligations are being met, especially for

[1] The South Asia Department of ADB maintains that the arrangement is an established practice with the Department of Economic Affairs, India, to pursue implementation and/or fiscal discipline (to motivate project completion on time), and that the project team continues to monitor and support the implementation of PCR preparation. It also notes that, in the cases where ADB has contributed to capacity improvements, this helps to ensure successful completion of the project.

Loan No.	Project Title	PCR Rating	PVR Rating	Reason for Disagreement and/or Comments
				subprojects that do not generate revenue.
2833	Infrastructure Development Investment Program for Tourism, (Tranche 2)	Less than likely sustainable	Less than likely sustainable	The substantial reduction in tourist arrivals and spending due to the pandemic had a knock-on effect on the financial and operational sustainability of revenue-generating subprojects. The subprojects have experienced financial and operational difficulties.
2331	Jammu and Kashmir Urban Sector Development Investment Program (Project 1)	Likely sustainable	Less than likely sustainable	Heavy dependence on budgetary support, and slow progress in cost recovery through tariffs and other means.
2925	Jammu and Kashmir Urban Sector Development Investment Program (Project 2)	Likely sustainable	Less than likely sustainable	Limited cost recovery and dependence on budgetary support.
3132 M0012	Jammu and Kashmir Urban Sector Development Investment Program (Project 3 and multitranche financing facility)	Likely sustainable	Less than likely sustainable	Heavy dependence on budgetary support. Slow revenue generation through user tariffs and property taxes and failure to implement the financial action plan for O&M cost recovery.
2226	Kerala Sustainable Urban Development Project	Likely sustainable	Likely sustainable	The PVR considered that envisaged funding by the municipal corporations through the introduction and updating of user charges and taxes was an appropriate intervention for sustainability. It is also noted that FIRRs of most subcomponents ranged from 5% to 18%, higher than the WACC, which was calculated as 4%.
2312	North Karnataka Urban Sector Investment Program (Tranche 1)	Less than likely sustainable	Less than likely sustainable	The FIRR for the water supply subprojects was negative because of poor water tariff collection efficiency. The cash flow projections for revenue from water charges at appraisal could not be realized in FY2013–2014, as the actual collection efficiency was lower than the projections for all three ULBs.
2638	North Karnataka Urban Sector Investment Program (Tranche 2)	Likely sustainable	Less than likely sustainable	Project FIRRs were negative, and tariffs were insufficient to cover O&M costs.
2366	Rajasthan Urban Sector Development Investment Program (Tranche 1)	Likely sustainable	Less than likely sustainable	The financial sustainability of the ULBs at present collection levels is insufficient to meet the O&M costs of environmental sanitation assets.
2506	Rajasthan Urban Sector Development Investment Program (Tranche 2)	Likely sustainable	Less than likely sustainable	The ULBs' financial sustainability with existing revenue collection levels is insufficient to meet the O&M costs of assets. There is a heavy dependence on transfers from the state government. The PHED still manages several assets in addition to ULBs.
2725 M0015	Rajasthan Urban Sector Development Investment Program (Tranche 3 and multitranche financing facility)	Likely sustainable	Less than likely sustainable	Existing revenue collection levels are not sufficient to meet O&M costs of assets. There is a heavy dependence on transfers from the state government.

Loan No.	Project Title	PCR Rating	PVR Rating	Reason for Disagreement and/or Comments
				Management of several assets is still performed by PHED rather than ULBs.
2410	Uttarakhand Urban Sector Development Investment Program (Project 1)	Likely sustainable	Less than likely sustainable	Only two of the four subprojects have FIRRs greater than the WACC. Without tariff increases, the other two subprojects would depend on government subsidies for O&M expenses. The financial capacity of ULBs is yet to be demonstrated.
2797 M0018	Uttarakhand Urban Sector Development Investment Program (Tranche 2 and multitranche financing facility)	Likely sustainable	Less than likely sustainable	Three out of six subprojects had negative FIRRs, and government subsidies were needed. Adequate tariff increases were not assured.

FIRR = financial internal rate of return, FY = fiscal year, O&M = operation and maintenance, PCR = project completion report, PHED = Public Health Engineering Department, PVR = project completion report validation report, ULB = urban local body, WACC = weighted average cost of capital.
Source: Asian Development Bank (Independent Evaluation Department).

9. Tables A7 and A8 aggregate the achievement of output and outcome indicators from projects that reported both targets and achievements in PCRs. Project achievements were gathered from IED-validated closed projects, based on actual achievements against targets.[2] Most of the achievements were below the targets for the outcome indicators except for the number of tourists. Among the outputs, those relating to sewerage and drainage were below their targets whereas those relating to water supply and wastewater treatment capacity exceeded the targets. Some active projects also reported preliminary yet significant results. For instance, the Kolkata Environmental Improvement Investment Program, Tranche 2 was able to reduce nonrevenue water from 50% to 25%, resulting in treated water provision to about 843,500 households for more than 12 hours per day on average. The property tax collection efficiency ratio improved from 67% to 83%.

Table A7: Output Targets and Achievements in Closed Projects

Indicator	Target	Achievement
Length of new water supply pipes installed (km)	1,949.00	3,674.05
Length of water supply pipes rehabilitated (km)	1,291.00	979.38
New network for sewerage (km)	2,292.00	1,514.05
Rehabilitated network for sewerage (km)	338.00	83.00
New drainage network (km)	146.80	73.82
Rehabilitated drainage network (km)	13.00	0.54
Wastewater treatment capacity (mld)	1039.50	1925.23

km = kilometer, mld = million liters per day.
Note: Based on Independent Evaluation Department validation of closed projects from 2012 to 2022.
Source: Asian Development Bank (Independent Evaluation Department).

[2] While some projects clearly articulated targets and reported on actual achievements, some reported only on achievements (without targets) or on targets (without achievements).

Table A8: Outcome Targets and Achievements in Closed Projects

Indicator	Target	Achievement
Population benefiting from improved water supply (million)	15.50	14.16
Population benefiting from sanitation (million)	9.50	6.32
Population benefiting from sewerage facilities (million)	3.17	1.97
Population benefiting from SWM facilities (million)	7.50	6.95
Population provided with flood protection facilities (million)	1.50	1.21
Increase in tourist numbers as a result of enhanced tourism environment (million)	23.96	62.25

SWM = solid waste management.
Note: Based on Independent Evaluation Department validation of closed projects from 2012 to 2022.
Source: Asian Development Bank (Independent Evaluation Department).

Table A9: Extent of Delivery of Outputs and Outcomes in Closed Projects with Project Completion Reports

Project	Total Outcomes (all loans)	Total Outputs (all loans)	Headline Outputs and/or Outcomes
Jammu and Kashmir – Urban Sector Development (MFF)	Tranche 1: 2 out of 3 outcomes were achieved.	Tranche 1: all but one of outputs were delivered	42 kilometers of drains constructed, well above the 26 kilometers target.
	Tranche 2: 2 out of 5 outcomes were achieved.	Tranche 2: 9 out of 19 targets were achieved. Outputs were generally incomplete at the time of completion.	Water supply increased from 2 hours to 8 hours per day.
	Tranche 3: only 1 out of 6 outcomes were achieved.	Tranche 3: Roughly half of outputs were achieved.	
Madhya Pradesh Urban Water Supply and Environmental Improvement	5 out of 8 quantifiable outcomes were achieved.	Water supply, drainage, and slum improvement outputs were achieved, while some sewerage and SWM outputs were not achieved.	Provided 24-hour access to water to a population of 5.6 million.
National Capital Regional Urban Infrastructure Facility (MFF)	Only 3 of many outcomes were achieved.	11 out of 16 outputs were achieved.	Piped water connections in Pataudi increased by 227%.
North Karnataka Urban Sector (MFF)	Tranche 1: over half of outcomes were not achieved.	Tranche 1: A number of water supply outputs were achieved, but achievement of outcomes will require later tranches to achieve household connections, metering, and volumetric charging.	53% of households experienced improved sanitation facilities.
	Tranche 2: all three outcomes were achieved or substantially achieved.	Tranche 2: only 2 out of 6 outputs were achieved and sewage outputs were well below targets.	90% water metering were achieved.
	Tranche 3: 2 out of 5 outcomes were achieved.	Tranche 3: 25 out 27 outputs were achieved.	Quality of water met national standards 90% of the time. Property tax assessment coverage increased to 100%.
Kerala Sustainable Urban Development	Outcome targets for drainage, flooding, and urban transport were met except water and sanitation only partially achieved.	Only 15%–20% of water and sewerage outputs were achieved. SWM targets were achieved other than landfill which was dropped.	Water delivery losses reduced by about 40%. Upgraded drainage system benefited 500,000 people.

Project	Total Outcomes (all loans)	Total Outputs (all loans)	Headline Outputs and/or Outcomes
Kolkata Environmental Improvement Investment Program, (2000) and additional loan (2006)	4 out of 5 outcomes were achieved.	Over 70% of outputs were achieved.	SWM targets were achieved for servicing 5 million people. Reduced disruption of traffic due to reduced flooding.
Northeast Capital Cities (MFF, Tranche 1)	2 out of 3 outcomes were achieved.	20 out of 21 outputs were achieved.	Water policy interventions in 4 out of 5 capital cities reduced nonrevenue water and O&M costs to improve water supply for a combined population of 1.06 million. The two engineered sanitary landfill facilities segregated and treated municipal wastes.
Rajasthan Urban Sector Development Investment Program (MFF)	Tranche 1: 7 out 11 outcomes were achieved.	Tranche 1: 21 out of 31 outputs were achieved (3 were not achieved and 7 were not applicable).	2.23 million people (95% of population) were given water connections.
	Tranche 2: 9 out of 12 outcomes were achieved but were evaluated by PVR to be poorly designed.	Tranche 2: 11 out 12 outputs were achieved.	Over 90% of solid waste were collected and transported.
	Tranche 3: PVR found 7 of 12 outcomes were achieved.	Tranche 3: PCR found 28 out of 31 outputs were achieved but these outputs were not sufficiently defined to demonstrate effective management	
Uttarakhand Urban Sector Development (MFF)	Tranche 1: 3 of 7 outcomes were achieved.	Tranche 1: 4 out of 36 outputs were achieved.	22,535 houses had new sewage connections.
	Tranche 2: 3 out of 4 outcomes were achieved. Nonrevenue water was not really assessed.	Tranche 2: 6 out of 12 outputs were achieved.	In Nainital, 100% of customers were billed for water.

MFF = multitranche financing facility, O&M = operation and maintenance, PVR = project completion report validation report, SWM = solid waste management.
Source: Asian Development Bank (Independent Evaluation Department).

10. Table A10 shows that large new landfill projects did not proceed due to land acquisition or use impediments and difficulties in meeting environmental safeguard conditions. Discussions with development partners indicated that such projects need a new approach and that the expansion of existing dumpsites by experienced private sector operators would be a realistic alternative to investing in new sites. ADB has experience of successful expansion of existing landfills, for instance, in Jammu and Kashmir. Recent ADB project loans have not included any solid waste management components, partly due to the difficulties it has encountered with landfills. Resolving this issue for one or two pilot projects may be advisable to enable ADB to re-enter the sector.

Table A10: ADB Past Project Experience with Solid Waste Management Landfills

Project	Problem	Status at Loan Closing
Jammu and Kashmir – Urban Sector Development (MFF, approved June 2009)	Inability to obtain three necessary land acquisitions meant that the construction of the approach road to the sanitary landfill site was not completed and the landfill could not become operational by the time of ADB loan closing.	Three landfills were expanded to a combined capacity of 958 metric tons per day. However, the quality of the operations may be substandard as hazardous waste is not being segregated from normal municipal waste.
Kerala Sustainable Urban Development Project (approved December 2005)	ADB funds could not be used in Kollam for the municipal solid waste landfill due to environmental safeguard noncompliance. The compost plant could not be completed due to public protests.	The existing sanitary landfill was developed, and a 75 cubic meter per day leachate treatment plant was constructed and commissioned in Kozhikode.
Madhya Pradesh Urban Water Supply and Environmental Improvement (approved September 2008)	The Bhopal project was dropped as no suitable site could be found and Gwalior opted out of the ADB program, using a central government funding scheme instead.	Jabalpur and Indore sanitary landfill pits were constructed.
North Eastern Region Capital Cities Development Investment Program MFF (approved July 2009)	Multiple delays were experienced in obtaining land clearance permission for landfills. Delays were incurred in the Shillong subproject due to the poor performance of the contractor. Contract retendering was done for the balance of works.	A short-term sanitary landfill was completed in Shillong and Kohima. The landfill included a leachate treatment and composting facility.
Rajasthan Urban Sector Development Investment Program MFF (approved November 2007)	In September 2021, the state directed the executing agency to withdraw from sanitary landfill works and transfer these to another state agency.	Two sanitary landfills were constructed but they are not operational.

ADB = Asian Development Bank, MFF = multitranche financing facility.
Source: ADB (Independent Evaluation Department).

11. The low rating for financial sustainability performance is partly due to weak compliance with financial sustainability covenants (Table A11). Full compliance was achieved for about 50% of covenants on tariff reform and financial management.

Table A11: Number of WUS Projects with Financial Sustainability Covenants and Extent of Compliance

Covenant Category	With Covenant	Full Compliance	Partial Compliance	No Compliance	Compliance Data Not Available
Financial management					
Annual audits	10	4	4	2	0
Implementation of accounting system	6	4	2	0	0
Tariff reform					
Water tariff	5	3	2	0	0
Sewerage charges	8	3	2	2	1
Solid waste management charges	3	1	2	0	0
O&M					
Equipment and property maintenance	10	9	0	0	1
Capacity development	2	1	1	0	0
Adequate or enhanced funds	6	6	0	0	0
Cost recovery of O&M costs for water supply	2	0	1	1	0

O&M = operation and maintenance; WUS = water and other urban infrastructure and services.
Note: The table is based on a review of 15 validated completion reports of projects that closed during 2012–2022.
Source: Asian Development Bank (Independent Evaluation Department).