

SECTOR ASSESSMENT (SUMMARY): WATER SUPPLY AND OTHER MUNICIPAL INFRASTRUCTURE SERVICES¹

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. **Sector Performance.** Karnataka is one of the most water-stressed states in India, yet its annual water use is forecasted to rise by up to 40% by 2025, threatening sustainable economic growth and poverty reduction. Declining water quality in most basins is also a cause of concern. Major sources of pollution include untreated sewage, industrial discharges, mining, watershed degradation, and pesticide and insecticide runoff. While 85% of water allocation is still dedicated for agricultural purposes, there are opportunities to improve water efficiency and productivity in urban areas.

2. About 84% of Karnataka's population has access to drinking water, and 38% has access to sanitation facilities.² However, there are higher unmet demands: only 25% of urban local bodies (ULBs) can supply per capita requirements, and in most ULBs distribution systems are inefficient, leading to high non-revenue water levels (ranging from 30% to 50%). Despite improvements, water supply services are still generally intermittent, with poor service standards (e.g., pressure and quality) and incomplete coverage and metering. More worrisome is that only 15% of Karnataka's ULBs have a functioning sewerage system with wastewater treatment. Where sewerage networks are not available, black and gray water is discharged into drains, most of which contributes to polluting Karnataka's water bodies. Meeting the rapidly rising urban and industrial water demand; protecting water bodies; and effectively treating, discharging, and reusing the effluents remain critical challenges. In addition, rapid urban sprawl and insufficient development control have led to construction in low-lying areas and inadequate drainage.

3. **Opportunities.** Karnataka has instituted the following important measures:

- (i) *Demand management and operation and maintenance recovery.* In 1996 the Government of Karnataka first directed ULBs to adopt volumetric tariffs. The government has since provided both technical support to ULBs and community education support to enhance acceptance of tariffs among citizens. On 20 July 2011, Government of Karnataka issued a revised tariff order (i) making metering compulsory, (ii) introducing sewerage tariffs, and (iii) raising minimum service levels. Compliance with the above ordinances is progressively being adopted by the ULBs.
- (ii) *Service management and efficiency.* Since 2004, Karnataka has embarked on several service delivery pilots with private sector participation. In 2012, the state resolved to mainstream models that promote construction plus management to all new schemes developed under the guidance of the Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC).
- (iii) *Urban finance and related reforms.* At the urban level, Karnataka has led the implementation of urban reforms and has enhanced fiscal, administrative, and

¹ This summary has been prepared from several documents, including 2012. Consultant's Report. Final Report: Volume 1 - Road Map with Strategic Investment Plan. Bangalore

<http://www.adb.org/projects/documents/karnataka-integrated-sustainable-water-resources-management-investment-program-tacr>.

² Of urban households, 92% have reported access to water and 42% to sewerage.

management capacities of the ULBs.³ Most remarkably, reforms (such as the development of property tax information systems, introduction of a fund-based double-entry accrual accounting systems, establishment of public grievance cells, and computerization of basic municipal functions) were institutionalized in the majority of the state's ULBs through a common program, with a supported information technology base and assistance from a dedicated body, the professionally staffed Karnataka Municipal Reform Cell.

4. **Issues and Challenges.** Despite good progress, the following challenges need to be addressed to achieve water security at local urban watershed and sub-basin levels:

- (i) *Inadequate city and regional water planning.* City development plans capturing current and future needs of water-related services are not frequently updated by ULBs and are rarely attached to investment financing plans. Economic and spatial growth of ULBs is often not carefully planned and phased in relation to natural resources. Regionally, the development of water sources has tended to take place on a suboptimal scheme-by-scheme basis with downstream impacts.
- (ii) *Inadequate water use monitoring.* Many ULBs still provide unmetered services, which prevents any accurate monitoring of abstraction and losses. ULB records show deficiencies in water quality testing at the consumer end and effluent discharge point and in the collection of basic information. Other associated water management agencies suffer from similar shortcomings.
- (iii) *Insufficient interagency coordination.* Responsibilities for water issues are fragmented between different departments without a formal mechanism to ensure adequate coordination.
- (iv) *Inadequate asset planning and management.* In most ULBs, water-related infrastructure asset creation (a) does not consider related impacts and/or opportunities, and (b) is not adequately phased. Most importantly, due to their conducting multiple functions, ULBs often lack the necessary technical staff strength to operate, maintain, or manage water and sewerage schemes.
- (v) *Insufficient investment and financing.* Despite improvements, urban infrastructure funding and asset sustainability are challenged by poor cost recovery mechanisms and the reluctance of representatives to levy user charges. ULBs often have limited financial administrative capacity, and revenue reforms must therefore be continued.
- (vi) *Policy and regulation.* Reforms are needed to establish a policy environment that (i) promotes the efficient use of water resources and (ii) fosters private sector participation via public-private partnerships (PPPs) at the urban level, with appropriate regulation performance standards and concern for equity.

5. **Contribution of Sector Development to the State's Growth.** Karnataka's gross domestic product grew annually on average by 7.2% from FY2007 to FY2012. Water is central to the development of economic activity across all sectors, most notably agriculture and manufacturing sectors. As for much of India, urban centers in Karnataka have driven service and manufacturing sector-led economic growth in the country, placing cities at the center of India's development agenda. However, growth has preceded development of infrastructure in many cities, which has rendered them inadequate to respond to population pressures and economic

³ Some key reform measures implemented by the Government of Karnataka's Urban Development Department linked to the implementation of the 74th constitutional amendment include the repeal of the Urban Land Ceiling Act (1999), the amendment of the Rent Control Act (2001), reduction in stamp duty, transfer of more responsibilities to the ULBs within the broader framework of the medium-term fiscal plan, and the introduction of a capital value based property taxation system.

demands. In addition to being an economic input, water and sanitation infrastructure is essential to the well-being and health of citizens; a high incidence of waterborne and vector diseases may ultimately undermine their productivity.

2. Government's Sector Strategy

6. **Key Strategies at Union and State Levels.** India's 12th Five Year Plan recognizes the constraints posed by the demands of a rapidly industrializing economy and an urbanizing society with limited potential for water supply growth, falling water tables, and water quality issues. The plan and India's 2013 water policy call for a paradigm shift in the management of water resources, which in urban areas centers around: (i) developing integrated urban water supply and sewerage systems; (ii) setting targets for water recycling and reuse by Indian industry; (iii) improving systems of water-related data collection and management; (iv) implementing regional demand management and planning; (v) moving toward more multidisciplinary, participatory water management approaches; and (vi) developing programs for watershed restoration and protection of water bodies. In addition, the plan also calls for a number of related and complementary strategic urban reforms, including (i) establishing municipal regulators, (ii) increasing the adoption of information technology among ULBs, and (iii) promoting PPPs.

7. Karnataka's Vision 2020 seeks to eliminate poverty and achieve the Millennium Development Goals by 2015 (i) through "a sustainable and orderly process of industrialization and urbanization," and (ii) in a way that ensures "sustainability of the state's environment and natural resources."⁴

8. **Road Map.** In support of the Government of Karnataka's integrated water resources management vision, the road map for the Karnataka Integrated Urban Water Management Investment Program aims to:

- (i) *Improve urban water management* by introducing (a) urban watershed planning to progressively enable integrated water resource planning at urban level and basin level and implement water security plans in ULBs; (b) urban water accounting to monitor water input and output parameters (quantity and quality) at the urban level to improve efficiency, regulatory compliance, and accountability; (c) institutionalized demand management practices to ensure fair and equitable distribution of scarce resources in the urban context; and (d) enhanced institutional coordination.
- (ii) *Improve technical and environmental sustainability* by (a) rehabilitating and/or providing new water supply and sewerage infrastructure to progressively achieve full water supply and sanitation service coverage to all urban households based on the principles of efficiency, security, and pollution prevention; and (b) implementing asset management and strengthening programs for better operation and maintenance of water supply and sewerage infrastructure leading to efficient service delivery.
- (iii) *Improve institutional and financial sustainability* by (a) improving utility management effectiveness through mainstreaming PPPs in service delivery, piloting regional utility associations to gain economies of scale, and raising awareness among citizens; (b) improving financial governance in ULBs and the KUIDFC to enhance financial management and operational and commercial efficiency; and (c) creating a suitable enabling environment by assisting in the establishment of the Water Council.

⁴ Karnataka State Planning Board. 2008. Karnataka: A Vision for Development. Bangalore.

9. **Factors Promoting Success.** Karnataka has pioneered municipal reforms under the Nirmal Nagara program, instituting fundamental changes to ULBs through a novel combination of information technology and local capacity development. Karnataka has also pioneered the introduction of private sector participation in service delivery, and it is expected to be one of the first states to introduce water service regulation.

10. **Role and Capacity of Concerned Agency.** The KUIDFC has implemented two Asian Development Bank (ADB) project loans⁵ and several World Bank loans, and it is responsible for the implementation of the North Karnataka Urban Sector Investment Program.⁶ Its staff is therefore familiar with the implementation and management of large projects financed by central, state, and multilateral development banks, including procurement, financial management, and safeguards compliance.

3. ADB Sector Experience and Assistance Program

11. **ADB Sector Experience in India.** ADB's urban sector portfolio consists of 21 loans under implementation in 17 states: 4 project loans (including 1 additional financing loan) and 17 tranche loans (under 9 multitranches financing facilities [MFFs]). ADB's interventions have strategically supported: (i) the provision of integrated municipal infrastructure promoting environmental sustainability and inclusiveness through targeted poverty reduction and gender mainstreaming components; (ii) improved governance and municipal reforms; (iii) the development of institutions and processes for innovative and sustainable urban infrastructure financing; and (iv) capacity building of ULBs for improved project implementation, service delivery, and utility management. ADB's engagement has fostered regional approaches to improve connectivity and develop tourism infrastructure, develop state-level urban infrastructure financial intermediaries, and initiate steps to enable and promote PPPs.

12. **ADB Sector Experience in Karnataka.** ADB has approved and implemented three investments in Karnataka (para. 10). The project completion report for the Karnataka Urban Development and Coastal Environmental Management Project⁷ rated the project successful and drew the following pertinent lessons: (i) the project and contract schedule should be realistic, taking into account the technical complexities of the project components and implementation capacities; (ii) house service connections for urban water and sewerage should be part of the project scope to ensure optimum utilization of outputs and timely delivery of benefits; (iii) low-cost sanitation facilities can have large social and economic impacts and help build local support for a project; (iv) targeted awareness campaigns aimed at changing the behavior of urban residents are necessary to achieve design results; and (v) for institutional reform, the use of a standardized set of systems and processes and a centralized control system at the state level help to reduce implementation effort, time, and cost, and attain acceptable quality, irrespective of ULB capacity and location.

13. **Proposed Sector Modality.** The MFF is well suited for this investment as it is the most

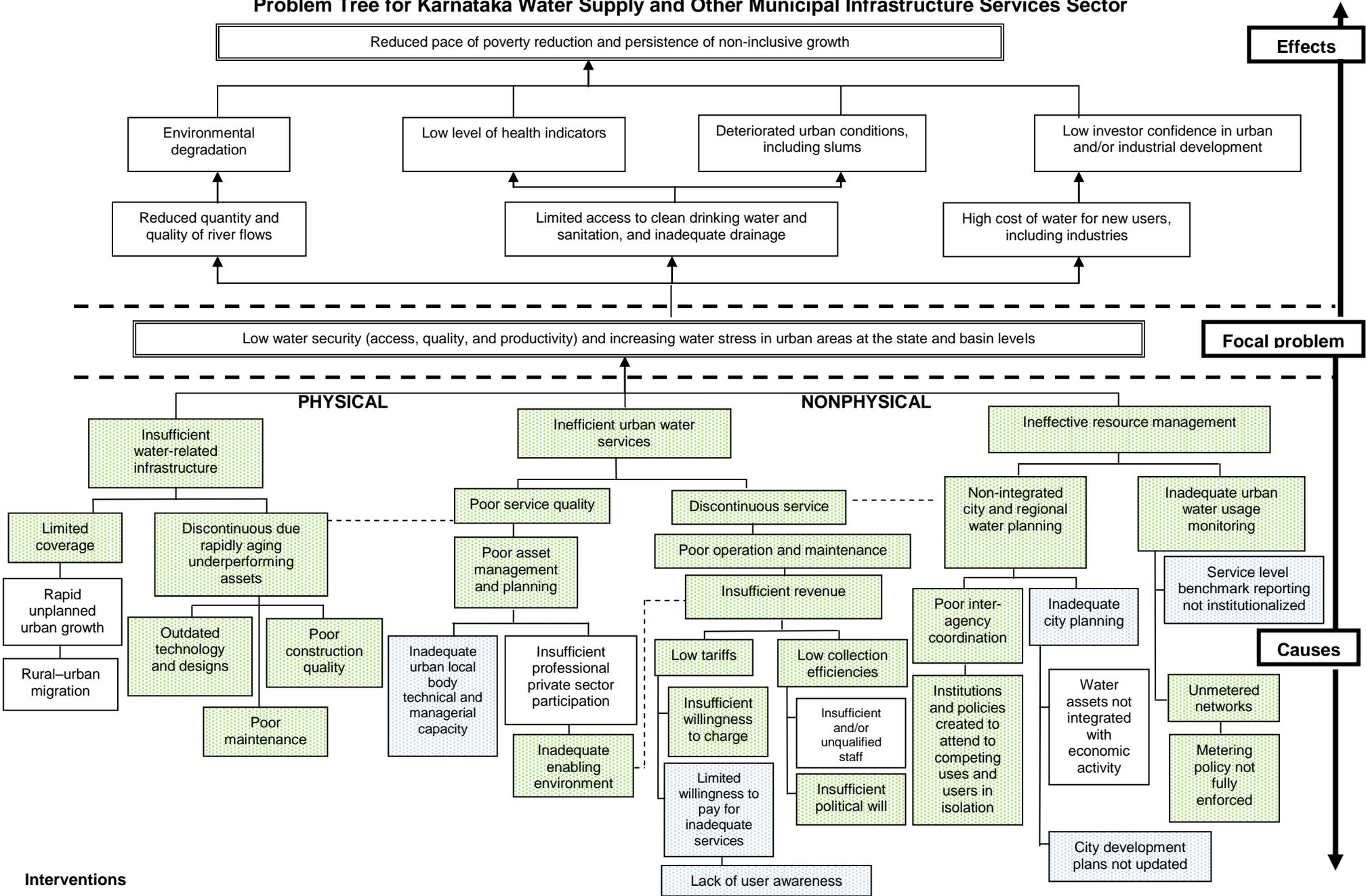
⁵ ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Karnataka Urban Infrastructure Development Project*. Manila; ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Karnataka Urban Development and Coastal Environmental Management Project*. Manila.

⁶ ADB. 2006. *Report and Recommendation of the President to the Board of Directors on a Proposed Multitranches Financing Facility to India for the North Karnataka Urban Sector Investment Program*. Manila

⁷ ADB. 2012. *Project Completion Report for the Karnataka Urban Development and Coastal Environmental Management Project*. Manila

effective modality to: (i) maximize and measure project results in localized geographical areas; (ii) provide efficiencies associated with economies of scale as additional municipalities join regional utilities; and (iii) blend capacity development, assistance for policy implementation, and infrastructure provision. The MFF will enable the state to programmatically implement a structured road map combining clearly defined criteria and a process that values demand and ULBs' willingness to advance reforms. The modality is well suited given (i) Karnataka's sound record in the sector, (ii) its willingness to undertake reforms, and (ii) the KUIDFC's proven implementation capacity. The program is expected to consist of two tranches. It is proposed that the first tranche will be approved in 2014 and the second tranche in 2016.

Problem Tree for Karnataka Water Supply and Other Municipal Infrastructure Services Sector



Interventions

Public investments for central (e.g., Urban Infrastructure Development Scheme for Small and Medium Towns), state facilities

Financing from Asian Development Bank (ADB) and the World Bank

Capacity building, and policy implementation programs by ADB and the World Bank

- Tranche 1
- Tranches 1 and 2

Sector Results Framework for Karnataka (Water Supply and Other Municipal Infrastructure Services, 2014–2022)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	Indicators with Targets and Baselines	Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
Planned, inclusive, and sustainable urban development through universal access to water and sanitation	<p>Percentage of urban households with access to safe and continuous drinking water supply increases to 100% in 2017 (2011 baseline: 64%)</p> <p>Percentage of urban households with minimum levels of solid waste collection increases to 100% in 2017 (2011 baseline: 72%)</p>	Water supply and other municipal infrastructure and services expanded, improved, and well managed	<p>Country outputs focus for:</p> <ul style="list-style-type: none"> - water supply coverage: 100% - non-revenue water < 15% - metering > 90% - continuity of supply 24 hours/day, 7 days/week; - quality of water supplied 100% compliance with norms; - efficiency redress customer complaints > 80%; - revenue collection efficiency > 90% 	<p>(i) Planned key activity areas</p> <ul style="list-style-type: none"> • Water supply and sewerage (85% of funds) • Urban financial governance reform for asset sustainability (9% of funds) • Capacity development (6% of funds) <p>(ii) Pipeline projects</p> <ul style="list-style-type: none"> • Karnataka Integrated Urban Water Management Investment Program (\$150 million) <p>(iii) Ongoing projects</p> <ul style="list-style-type: none"> • North Karnataka Urban Sector Investment Program (\$270 million) 	<p>(i) Planned key activity areas</p> <ul style="list-style-type: none"> • Additional people served with water: 765,000 • Additional people served with sewerage: 400,000 • Approximately 50 million liters per day water treatment plant capacity added <p>(ii) Pipeline projects</p> <ul style="list-style-type: none"> • Bangalore City Cluster Development Investment Program (\$300 million) <p>(iii) Ongoing projects Under North Karnataka Urban Sector Investment Program</p> <ul style="list-style-type: none"> • Approximately 1,200 kilometers of new and/or rehabilitated water network laid. • water treatment capacity increased by 180 million liters per day • Approximately 1,700 kilometers of new and/or rehabilitated sewer network laid. • sewage treatment capacity increased by 253 million liters per day.

ADB = Asian Development Bank.

Sources: Government of India, Planning Commission. 2012. *Twelfth Five Year Plan, 2012–2017*. New Delhi.; Ministry of Urban Development. 2008. *National Urban Sanitation Policy*. New Delhi; Ministry of Urban Development. 2010. *Handbook of Service Level Benchmarking*. New Delhi; Asian Development Bank estimates.