

## SECTOR ASSESSMENT (SUMMARY): WATER AND OTHER INFRASTRUCTURE AND SERVICES<sup>1</sup>

### Sector Road Map

#### 1. Sector Performance, Problems, and Opportunities

1. **Challenges to drinking water security in India.** A study conducted by the World Bank in 2010 found that 85% of all rural water supply schemes in India rely on groundwater.<sup>2</sup> One of the greatest public health threats in India is from naturally elevated levels of arsenic and fluoride in groundwater. The Ministry of Drinking Water and Sanitation (MDWS) of the Government of India estimated that around 16 million people are at risk from arsenic contamination and 11 million people are at risk from fluoride contamination.<sup>3</sup> Drinking water with high concentrations of arsenic in the long term can lead to a range of health problems in humans, including cancer, while chronic exposure to fluoride may cause dental or skeletal fluorosis and bone diseases caused by excessive accumulation of fluoride in the bones.

2. **Rural drinking water services in India.** Though 77% of the rural population in India is estimated to have access to basic water supply, only 56% of the rural households have access to piped water, mostly through public standposts only.<sup>4</sup> India has achieved good coverage in basic water supply infrastructure; however, growing concerns over its sustainability led the government to launch various sector reforms and programs starting from the late 1990s, including decentralization of service delivery responsibilities.<sup>5</sup> In 2010, the MDWS launched the National Rural Drinking Water Program, emphasizing the active involvement of *panchayati raj* institutions in the planning, implementation, and management of drinking water supply schemes.<sup>6</sup> The goal of the National Rural Drinking Water Program is to cover 90% of India's rural population with piped water by 2022 and to provide water supply connections to 80% of rural households. However, there is a considerable gap between this desired service level and the current services available to rural areas in India. Limited provision of household connections (only about 17% of rural population in India have household connections) and weak institutional and financing arrangements and capacities of the local bodies have led to poor operation and maintenance (O&M) of assets and suboptimal service delivery (footnote 5).

3. **Challenges to drinking water security in West Bengal.** West Bengal, India's fourth most populous state, is the worst impacted, hosting around 72% of India's total population at risk from elevated levels of arsenic in drinking water, and 5% of the population at risk from fluoride contamination. Government of West Bengal (GOWB) estimates that around 91% of the rural and

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<sup>1</sup> This summary is based on studies and information gathered by the Asian Development Bank's project preparatory team. Sources for information are cited in the document.

<sup>2</sup> World Bank. 2010. *Deep Wells and Prudence: Towards Pragmatic Action for Addressing Groundwater Over-exploitation in India*. Washington, DC.

<sup>3</sup> Government of India, Ministry of Drinking Water and Sanitation. Integrated Management Information System. Data valid as of 1 April 2016.

<sup>4</sup> Arsenic and Fluoride in Drinking Water West Bengal: Characteristics, Implications, and Mitigation (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President). This report was used by the Public Health Engineering Department (PHED) and the project preparatory consultants in planning and designing the project.

<sup>5</sup> The 73rd and 74th amendment acts of the Constitution of India give the responsibilities of managing water supply and sanitation services to the local urban and rural bodies.

<sup>6</sup> The *panchayati raj* system of local governance in India has three administrative levels: *gram panchayat* (village level), *panchayat samiti* (block level), and *zilla parishad* (district level). The system was formalized in 1992 by the 73rd amendment to the Constitution of India.

41% of the urban population of West Bengal still rely on groundwater reserves for drinking, exposing a large part of the state's population to the risk of contamination.<sup>7</sup> This excessive reliance on groundwater aggravates the exposure to arsenic and fluoride in the drinking water because of the effects of climate change. In 2017, out of the total population of around 74.6 million in West Bengal, about 19.5 million were affected by arsenic and fluoride contamination. The Asian Development Bank (ADB) engaged the British Geological Survey to carry out a detailed analysis of arsenic and fluoride in drinking water sources in West Bengal. The analysis studied drinking water sources' characteristics, implications of contamination, mitigation measures, and lessons learned from elsewhere (footnote 4). The analysis shows that piped water from surface sources offer greater certainty in water quality and security over the long term compared with in situ groundwater treatment practices for arsenic or fluoride. Further, increased withdrawal of groundwater along the coastal belt of the state has hastened the intrusion of salinity into freshwater reserves.

4. **Drinking water service delivery in West Bengal.** Only about 47% of West Bengal's rural population has piped water, compared with the national average of 56%.<sup>8</sup> Piped water in the rural areas is supplied mostly through public standposts, without household connections. The Public Health Engineering Department (PHED), the state-level entity under the GOWB, is responsible for rural water supply in West Bengal. Although decentralization is underway in the state with single village schemes being handed over to the *gram panchayats*, all multi-village schemes are still operated and maintained by the PHED. The PHED fully manages drinking water supply to most of the state's rural population and to 80 of its 114 municipalities. It also provides bulk water to many urban clusters and municipal corporations in the state.<sup>9</sup> The PHED also manages the state's budget for rural drinking water supply for both capital investments and O&M. Some of these funds are released to the *gram panchayats* for O&M through the *panchayat samitis* at the block level and the *zilla parishads* at the district level. The *gram panchayats'* lack of technical capacity and inability to generate adequate revenues either through user charges or other resources have been major issues for the sustainability of drinking water schemes. The *panchayat samitis* and *zilla parishads* have limited technical capacity to support the *gram panchayats*. Also, due to lack of funds and an integrated approach to planning, schemes are generally designed for smaller block-level habitations rather than spatially for a basin or a district, resulting in suboptimal use of water resources, loss of economies of scale, and system inefficiency. In North 24 Parganas district alone, the PHED manages 211 individual drinking water schemes.

5. **Rural sanitation in West Bengal.** The GOWB is currently implementing intensive rural sanitation improvement programs across the state focusing on the construction of toilets so that all districts in the state can be declared open defecation free (ODF) by October 2019 in line with the Government of India's national targets under their recently launched *Swachh Bharat* Mission (clean India campaign). In West Bengal, the *Swachh Bharat* Mission is known as Mission Nirmal Bangla. The state is among the best performing in India, as about 91.6% of its rural population has access to toilets, and four of the state's 23 districts have already been declared ODF. Three more districts are expected to achieve ODF status in 2018. As of July 2017, among the 3,349 *gram panchayats* in the state, 1,963 (58%) had been declared ODF. While three of the four project districts have either been declared or are close to achieving ODF status, Bankura district needs a significant push to improve its sanitation and achieve ODF status. The GOWB's *panchayats* and Rural Development Department, the responsible agency for the implementation of the rural

<sup>7</sup> Data from Integrated Management Information System of Public Health Engineering Department, Government of West Bengal, valid as of 1 April 2016.

<sup>8</sup> Piped water supply is generally through public stand posts and is less than 55 liters per capita per day.

<sup>9</sup> Government of West Bengal, PHED. Integrated Management Information System. Data valid as of 1 April 2017.

Mission Nirmal Bangla, is prioritizing its implementation in low-coverage districts, such as Bankura. The GOWB has confirmed that it has adequate resources to meet their targets on rural sanitation infrastructure provision, but challenges would remain in the state, including the lack of a regulatory framework for the management of fecal sludge and septage, and the need to improve awareness and capacity building at local levels. Sustained improvement in public health can only be achieved when integrated with improved behavioral change, awareness, and sanitation.

6. **Opportunities.** West Bengal is the sixth largest economy among the states of India. Its gross state domestic product expanded at a compound annual growth rate of 10.6% from fiscal year (FY) 2005 (ended 31 March) to FY2016, and was \$140.5 billion in FY2016.<sup>10</sup> West Bengal was also the first state in the country to successfully implement the *panchayati raj* institutions system and devolve responsibilities to its *gram panchayats*, *panchayat samitis*, and *zilla parishads*, which play key roles in development planning, implementation, and service delivery. It has one of the strongest and well-established *panchayati raj* institutions systems in India. The PHED has strong technical and institutional capacity as a project planner and implementer, and a bulk water supplier. This provides a significant opportunity for initiating the necessary institutional changes to change the prevailing paradigm from asset building to one of service and supply of rural water in the state.

## 2. Government's Sector Strategy

7. **Government's sector strategies and reforms.** The GOWB, through its Vision 2020, and the Government of India, through its National Sub-Mission on Arsenic and Fluoride, are both prioritizing and investing in shifting people from reliance on groundwater through hand pumps or tube wells to sustainable surface water based piped water schemes.<sup>11</sup> Vision 2020 incorporates the priorities of the National Rural Drinking Water Program (para. 2), which include creating an enabling environment for the *panchayati raj* institutions and increasing the participation by and capacities of local communities to manage their drinking water sources and systems. In addition, as the result of extensive policy dialogue between ADB and GOWB during project preparations, the GOWB issued a government order to all project *gram panchayats* on 9 November 2017 on the asset management and service delivery framework. The order clearly defined the roles and responsibilities of the PHED (the bulk supplier and regulator) and the *gram panchayats* (the distribution service managers), and set guidelines for metering, tariffs, and human resourcing.<sup>12</sup>

## 3. ADB's Sector Experience and Assistance Programs

8. ADB's interventions in the water and other urban infrastructure and services sector comprise 20 projects under implementation as of November 2017. ADB has strategically supported several initiatives in the sector, including (i) provision of robust infrastructure, (ii) promotion of environmental sustainability and inclusiveness through targeted poverty reduction and gender mainstreaming components, (iii) governance and reforms, (iv) development of institutions and processes for innovative and sustainable infrastructure financing, and (v) capacity building of local agencies for improved service delivery. ADB has also provided past support for

<sup>10</sup> Government of West Bengal. Department of Planning, Statistics and Programme Monitoring. Data valid as of 1 September 2017.

<sup>11</sup> Government of West Bengal, Public Health Engineering Department. 2011. *Vision 2020: To provide Safe, Sustainable, and Adequate Water Supply to All Humans and Livestock in West Bengal by 2020*. Kolkata; and Government of India, Ministry of Drinking Water and Sanitation. 2016. *National Sub-Mission Guidelines to Provide Safe Drinking Water to Arsenic and Fluoride Affected Habitations in Rural India on Mission Mode*. New Delhi.

<sup>12</sup> Government Order on Asset Management and Service Delivery Framework (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

three projects in West Bengal in the sector, including the Kolkata Environmental Improvement Investment Program.<sup>13</sup> All projects previously implemented in West Bengal were rated *successful*.

9. **Lessons learned.** ADB's assessment of lessons learned from ADB's water sector projects in India and elsewhere shows that sustainability of assets and services created under projects are dependent on adequate institutional and operational capacity of the local bodies that manage them, and the establishment of clear mechanisms and political will to charge for services.<sup>14</sup> Other important lessons include the following: (i) project timelines need to take into account implementation complexity; the experience of the executing agency, consultants, and contractors; and the available working seasons; (ii) contract packaging should be based on the technical parameters, size, and availability of potential contractors and should ensure the equitable distribution of risks and assurances from all parties to a contract; (iii) project readiness should be enhanced before implementation; (iv) the project scope should include water service connections for households to support optimum utilization of outputs and timely delivery of benefits; (v) targeted awareness campaigns aimed at changing the behavior of the end users are necessary to achieve design results; and (vi) fully staffed project management units and involvement of the executing agencies from the outset are necessary to create ownership and commitment. Experience from the sector also shows that behavior change communication, sanitation support, and community awareness must be integrated with infrastructure provision to sustain improved health impacts. The proposed project design incorporates these key lessons.

10. **ADB's strategic vision.** ADB's country partnership strategy, 2018–2022 for India is in line with the GOWB's Vision 2020 as well as the Government of India's new 15-year vision (up to FY2031), 7-year strategy (up to FY2023), and 3-year action agenda (FY2017–FY2019), which collectively replace its 5-year national development plan.<sup>15</sup> As guided by ADB's Water Operational Plan, 2011–2020, the proposed project will give priority to (i) incorporating increased efficiency and productivity; (ii) using technological advancements; and (iii) bringing private sector efficiency into operations. ADB will also support skills and capacity building of local stakeholders on behavioral change, sanitation planning, and promotion of gender equity by including and providing skills training and employment to local women.

11. **Proposed sector modality.** The sector lending modality is appropriate for the project since (i) the GOWB has a clear sector development plan—Vision 2020—to meet sector priority needs; (ii) project preparatory team carried out detailed analysis to establish that the PHED is a capable executing agency with adequate institutional capacity to implement the sector development plan and the project; and (iii) the policies applicable to the sector are appropriate and will be improved through the project.

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<sup>13</sup> ADB. 2000. Report and Recommendation of the President to the Board: *Calcutta Environmental Improvement Project*. Manila. <https://www.adb.org/projects/documents/calcutta-environmental-improvement-project-rrp>; ADB. 2006. Report and Recommendation of the President to the Board *Supplementary Loan to India for the Kolkata Environmental Improvement Project*. <https://www.adb.org/sites/default/files/project-document/66068/29466-ind-pam.pdf>; and ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to India for the Kolkata Environmental Improvement Investment Program*. Manila. <https://www.adb.org/sites/default/files/project-document/78962/42266-013-ind-rrp.pdf>.

<sup>14</sup> Independent Evaluation Department. 2017. *Country Assistance Program Evaluation: India, 2007–2015*. Manila; and ADB. Independent Evaluation Department. 2015. *Sustainability of Urban Water Supply and Sanitation Operations: Findings and Lessons*. Manila:

<sup>15</sup> ADB. 2017. *Country Partnership Strategy: India, 2018–2022*. Manila.

**Problem Tree for Water and Other Infrastructure and Services**

