

SECTOR ASSESSMENT (SUMMARY): INFRASTRUCTURE

Sector Road Map

1. Sector Performance, Problems, and Opportunities

A. Power Sector Overview

1. Bangladesh suffers from a chronic shortage of electrical power. Gas is the main energy source used for generating electricity, but Bangladesh's production of gas is insufficient to meet current demand. The supply of electricity is 28% less than the demand.¹ Energy shortages are undermining the country's competitiveness, causing an estimated annual loss of 2% of gross domestic product (GDP); the situation is not expected to improve in the short term, because gas production is projected to decline beginning in 2019.² Securing new sources of energy locally or abroad (e.g. coal or liquid natural gas) will take time because of the need for policy decisions setting energy tariffs at market levels.

2. Energy efficiency is a cost-effective response to energy shortages. To extend gas supplies, existing gas-fired power plants can be made more efficient.³ Demand can also be reduced, and the Government of the People's Republic of Bangladesh has taken several initiatives—daylight savings time, holiday staggering, and controlled shopping hours—to reduce commercial and residential demand. Energy efficiency initiatives can also target industries, which consume (directly and indirectly) about 50% of Bangladesh's gas. Industries also directly consume oil (for captive generators) and coal (e.g., the brick-making industry imports 2 million–3 million tons of coal a year). Given the increasing importance of oil and coal in Bangladesh's energy mix, energy efficiency has also become critical in containing the country's carbon emissions.

B. Renewable Energy Sector Overview

3. The government aims to generate 5% of the country's electricity from renewable energy by 2015 and 10% by 2020.⁴ It announced recently that it is seeking to produce 500 megawatts (MW) of electricity from various renewable energy sources, or about 10 times the country's current generation from such sources. Under the strategy established by the Power Ministry, 200MW of renewable energy will be generated using photovoltaics, 200 MW from wind power, 45 MW from biomass, 45 MW from biogas, and 15 MW from other sources. However, for this goal to be reached, the government must attract significant private sector participation in the renewable industry, which is largely absent at present.

C. Transport Sector Overview

4. The transport system of Bangladesh consists of roads, railways, inland waterways, two seaports, maritime shipping, and civil aviation, catering to both domestic and international traffic. There are about 271,000 kilometers (km) of roads, including some 21,000 km of major roads;

¹ Bangladesh Power Development Board. 2012. *Annual Report 2010–2011*. Dhaka.

² ADB. 2011. *The Comprehensive Private Sector Assessment of Bangladesh*. Dhaka.

³ ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Power System Efficiency Improvement*. Manila (LN2769–BAN, approved on 11 August).

⁴ Government in Bangladesh plans to boost generation of renewable energy by a factor of ten: minister. (2011). Issue 234, 11 July 2011. en.wikipedia.org/wiki/Electricity_sector_in_Bangladesh

2,835 route-km of railways; 3,800 km of perennial waterways, which increases to 6,000 km during the monsoon; the ports of Mongla and Chittagong; three international airports (Dhaka, Chittagong, and Sylhet); and eight domestic airports. The majority of major transport infrastructure improvements have targeted roads, followed by ports (especially in Chittagong) and civil aviation. The railway network inherited from the British Indian Railway system remains virtually unchanged in terms of route-km—it is a disjointed network separated by the Jamuna River, with two separate and incompatible gauges. Navigable inland waterways have perennially shrunk from about 8,000 km in 1970, in part because of inadequate dredging.

5. Motor vehicle registrations increased from 0.74 million in 2003 to 1.84 million in 2012—a 149% increase. The greatest increase was for two-wheel vehicles; the number of registered non-two-wheel motor vehicles on the road increased by 109% in the same period. About 40% of vehicles are registered in Dhaka. Most cars (76%) are registered in Dhaka, but few auto rickshaws (5%). In FY2010, about 66 million passengers were transported by Bangladesh Railway, up from about 43 million during FY2004. Freight traffic in FY2010 was 2.714 million tons, compared with 3.473 million tons in FY2004. A container train was introduced during August 1991. As a result, container traffic increased from 448,000 tons in 2002/03 to 540,000 tons in 2009/10. Chittagong is the principal port, handling 85% of imports to Bangladesh and 80% of exports out of Bangladesh. The quantity of containers handled at Chittagong annually increased on average about 12% from 2004 to 2011. In FY2011, the port handled around 1.47 million twenty-foot equivalent units, and bulk cargo reached approximately 45 million metric tons. In the last 10 years, Mongla has lost half of its market share to Chittagong. Mongla now handles only about 15% of Bangladesh's seaborne trade. At present (FY2012), about 265 ships call at Mongla per year, and it handles about 2.6 million metric tons of imports and exports each year, only a small portion of which is container cargo.⁵

D. Urban Infrastructure Sector Overview

6. Bangladesh is urbanizing rapidly. As of 2011, the estimated total population was 150.5 million, 28.4% (42.7 million) of which was urban. Since 2000, the urban population has been growing by 3.1% every year, significantly higher than the rural growth rate of 0.8%. Bangladesh is the most densely populated country in the world, with Dhaka and Chittagong among the fastest growing megacities. About 15 million people lived in Dhaka in 2011, accounting for more than one-third of the total urban population.⁶ Both the urban population and economic opportunities are concentrated in the largest cities.

7. Bangladesh's rapid urbanization is a vital aspect of the country's development process from a low- to a middle-income country, and is essential for the realization of "Vision 2021," which predicts economic growth that provides an average per capita income of \$2,000 a year.⁷ However, urbanization challenges the government's ability to provide the basic public utilities required by a rapidly rising urban population if the growth and poverty reduction potential of urbanization is to be realized. The challenge is intensified by the lack of a comprehensive urban strategy policy that could harness the beneficial aspects of urbanization, while also addressing

⁵ Figures are taken from the Bangladesh Road Transport Authority (<http://www.brta.gov.bd/index.php/statistics>), Bangladesh Railway (www.railway.gov.bd), various issues of Chittagong Port Authority (<http://cpa.gov.bd/portal/home.php?option=download&item=download>) and the Mongla Port Authority (<http://www.mpa.gov.bd/>).

⁶ Figures taken from the World Bank databank. <http://databank.worldbank.org/ddp/home.do#>

⁷ United Nations Children's Fund, Bangladesh. 2010. *Understanding Urban Inequalities in Bangladesh: A prerequisite for Achieving Vision 2021*. Dhaka.

the negative externalities.⁸

E. Education and Health Sector Overview

8. Bangladesh has made significant progress in terms of access to education. In 2011, the gross primary enrollment rate was about 95%, with secondary enrollment of 52% (nearly triple the 1980 secondary enrolment). Tertiary enrolment was about 14%, a significant improvement from 3% in 1980. Bangladesh has already met the Millennium Development Goal target relating to gender parity in primary and secondary schooling. However, despite significant progress in improving access to education, the quality of education remains a major issue; in 2010 the adult literacy rate was 57%, and the female literacy rate 52%. The students–teacher ratio is high—43:1 for primary education and 28:1 for secondary education—which may negatively impact the quality of the teaching and learning environment.⁹

9. Health outcomes have improved greatly in Bangladesh. In 2011, infant and child mortality rates had dropped to half the level in 2002;¹⁰ life expectancy rose to 69 in 2011, from 60 in 1990.¹¹ Total fertility rates have been more than halved during the same period. Rates of maternal mortality and undernutrition remain high but are declining.¹²

F. Constraints in Infrastructure Financing

10. The public sector has been the main provider of basic infrastructure in Bangladesh, as is true for most of South Asia. However, public financing alone cannot generate the investment needed to provide the required level of infrastructure facilities. The financial performance of most public service providers is weak, with inadequate investment. To enhance the role of the private sector in the provision of infrastructure services, the government is (i) revising policies and regulations across sectors for enhancing private sector participation in infrastructure development, including through public–private partnerships (PPPs);¹³ and (ii) enabling arrangements to bridge the enormous deficit in infrastructure financing, especially for long-term funds.

2. Government's Sector Strategy

A. Policy Response of the Government

11. The government has focused infrastructure development efforts on PPPs, in order to both gain efficiencies from private sector operation and management of infrastructure services and to tap private sector sources of long-term capital investment. Few PPPs have been realized, however, due to a combination of a lack of proper project preparation ahead of bidding, the

⁸ Government of Bangladesh, Planning Commission, General Economics Division. 2008. *Moving Ahead: National Strategy for Accelerated Poverty Reduction II (FY2009–2011)*. Dhaka

⁹ Government of Bangladesh, Directorate of Education. 2012. *Bangladesh Primary Education Annual Sector Performance Report (ASPR-2012)*. Dhaka. (<http://www.affordable-learning.com/content/dam/plc/prkc/uk/palf/Bangladesh%20National%20Assessment.pdf>)

¹⁰ The infant mortality rate refers to the probability of dying between birth and exactly 1 year of age expressed per 1,000 live births. Under-five mortality rate refers to the probability of dying between birth and exactly 5 years of age expressed per 1,000 live births.

¹¹ World Bank databank. <http://databank.worldbank.org>

¹² United Nations Children's Fund. http://www.unicef.org/infobycountry/bangladesh_bangladesh_statistics.html

¹³ PPP projects are typically projects developed, implemented, and operated by bidders (stand-alone special purpose vehicles). Further, these projects have been selected on the basis of a competitive and transparent bidding arrangement and are expected to be build-and-operate infrastructure based on a concession with the government.

potential lack of affordability for users of privately-developed infrastructure, and insufficient availability of long-term debt capital. Furthermore, there is a lack of discipline and oversight to ensure infrastructure projects funded by the government are of appropriate quality, and managed properly.

12. To address these issues, in 2010 the government adopted a policy and strategy for PPPs that comprises a comprehensive framework for realizing PPP project development and investment, supported by a professionally-managed PPP project development office (PPPO), with fiscal viability overseen by a separate PPP unit (PPPU) in the Ministry of Finance (MOF). The Asian Development Bank (ADB) is currently providing technical assistance to develop the operating principles and supporting institutions for this framework.¹⁴ To complement this initiative, the government, through the MOF, has sought to establish three critically-needed PPP funding vehicles: (i) a PPP technical assistance fund (PPPTAF), targeted at providing upfront risk capital for funding proper development of PPP projects in preparation for international competitive bidding as managed by the PPPO; (ii) viability gap fund (VGF), to provide “buy-down” funding on PPP project costs in order to improve affordability of user fees for PPP infrastructure; and (iii) Bangladesh Infrastructure Finance Fund Limited (BIFFL), a long-term capital funding vehicle that seeks to raise debt capital markets funding from retail and institutional investors to support construction and take-out financing for PPP projects. The government has seeded this facility with \$230 million equivalent of government funds.

3. ADB Sector Experience and Assistance Program

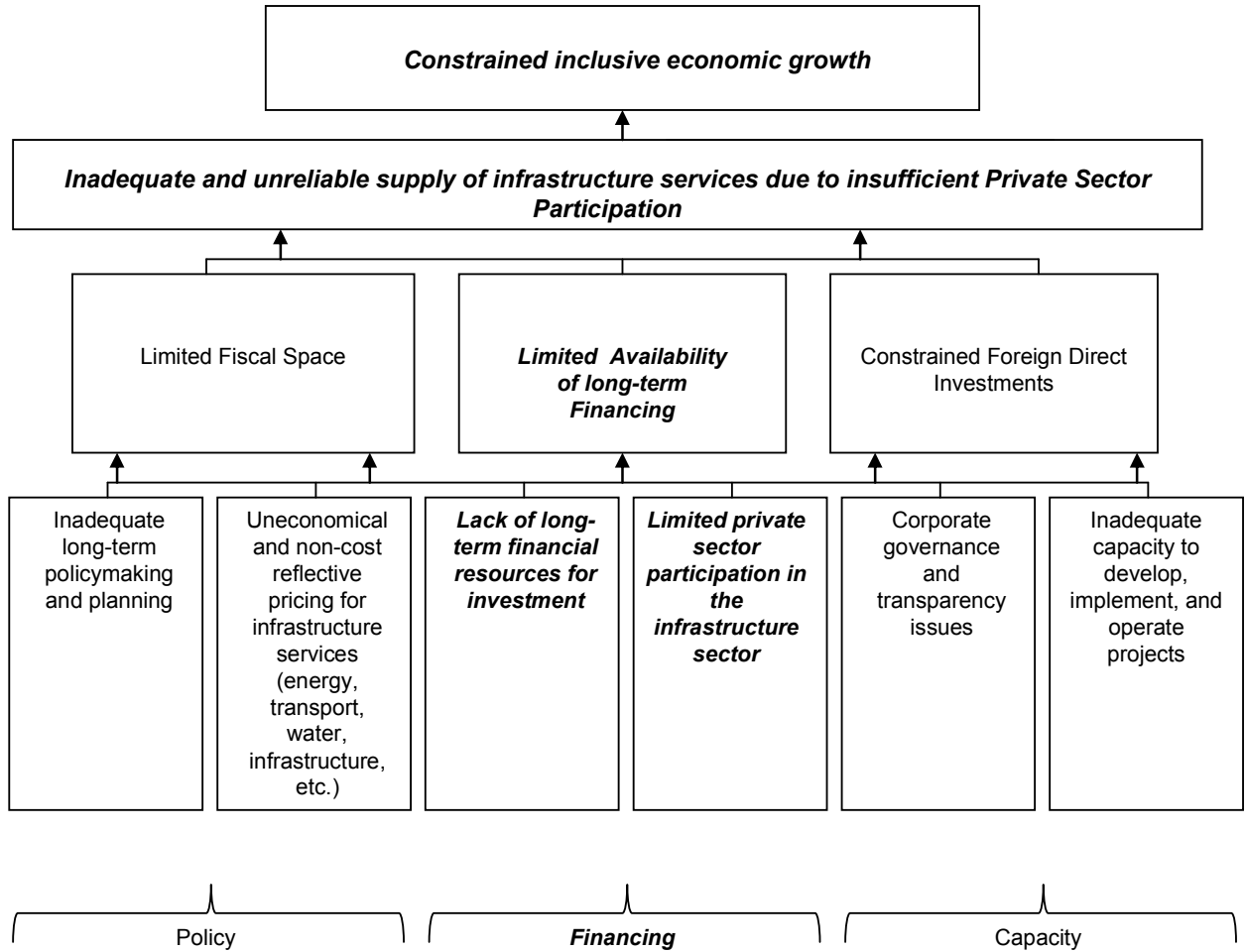
13. ADB’s country partnership strategy (CPS) 2011–2015¹⁵ for Bangladesh emphasizes the need for support of private sector-led infrastructure development. This is in line with Bangladesh’s Sixth Five-Year Plan (2011–2015), which focuses on accelerating the growth rate of the economy and reducing poverty by substantially boosting private sector investment and developing infrastructure. In particular, it emphasizes the need to triple spending on infrastructure, from 2% to 6% of GDP, with substantial participation of the private sector through PPPs. The CPS highlights that Bangladesh faces a high risk from climate change impacts—including sea level rise, frequent floods, tidal waves, and cyclones—which threaten to erode the progress made in reducing poverty. Environmentally-sustainable development requires (i) that climate change considerations be integrated into development programs and projects, and (ii) capacity building with respect to climate change adaptation and mitigation. Moreover, the objectives of the project are in line with the ADB Financial Sector Operational Plan,¹⁶ which prioritizes capital market development for infrastructure finance and financial inclusion.

¹⁴ ADB. 2010. *Technical Assistance for Public–Private Partnership Program Operationalization—Bangladesh*. Manila (TA 7691, approved on 6 December).

¹⁵ Asian Development Bank. 2011. *Country Partnership Strategy*. http://www.adb.org/sites/default/files/cps-ban-2011-2015_0.pdf

¹⁶ Asian Development Bank. 2011. *Financial Sector Operational Plan*. <http://www.adb.org/sites/default/files/financial-sector-operational-plan.pdf>

Problem Tree for Infrastructure



Sector Results Framework (Infrastructure, 2013–2025)

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
<p>Better financial intermediation for infrastructure PPP projects</p> <p>Expansion and optimization of power transmission and distribution systems</p> <p>Lowering of power distribution losses</p> <p>Greater private participation in the road and water sectors</p> <p>Strengthening of urban and/or municipal institutions and governance</p> <p>Increased development of renewable energy facilities</p>	<p>Gross capital formation as percentage of GDP increases to 26.5% by 2025 (Baseline 2011: 24.7%)</p>	<p>Increased private sector participation in infrastructure development, including in renewable energy facilities</p>	<p>77.2% of total plan investment (Tk10.4 trillion out of 13.5 trillion) will be financed by the private sector.</p> <p>Private investment accounts for 25% of GDP by 2015 (2011 Baseline: 19.5%)</p>	<p>Increased available long-term debt financing for innovative infrastructure projects</p> <p>Increased availability and accessibility of financing for SHS</p>	<p>Number of financial closures for large projects (more than \$10 million) increased by four by 2019 (Baseline 2013: one)</p> <p>Amount of additional private capital mobilized under this project increased by \$150 million by 2019 (Baseline 2013: \$50 million)</p> <p>Number of SHS installations increased by at least 33,333 by 2019 through this project (Baseline February 2013: Total of 2 million SHS financed)</p> <p>33,333 new households with access to electricity by 2019 (Baseline: 84 million—55.3% of total population of 152 million)</p> <p>57,500 tons of GhG emissions reduced by 2019 (Baseline 2009: 55.3 million tons for all of Bangladesh)</p> <p>33,333 additional microfinance accounts opened and end borrowers reached by 2019 under this project (Baseline 2011: 20.9 million)</p> <p>SHS installation sales to women increase to 30% by 2019 (Baseline: tbd)</p>

ADB = Asian Development Bank, GDP = gross domestic product, GhG = greenhouse gas, PPP = public–private partnership, SHS = solar home system, TBD = to be determined.

Source: Asian Development Bank.