

## ECONOMIC ANALYSIS

### I. Background

1. Bangladesh has been showing strong growth performance with a gross domestic product (GDP) growth rate estimated to have exceeded 7% in FY2016, for the second time in the last three decades—driven on the supply side by services and rise in public investment and consumption expenditures on the demand side.<sup>1</sup> With its vision to become a ‘middle income’ country by 2021, Bangladesh needs to steer the economy towards accelerated progress and achieve the required average GDP growth of 7.4% during the Seventh Five-Year Plan, FY2016–FY2020.<sup>2</sup> As such, investment rate will need to expand from 28% in FY2015 to around 34% by FY2020. Much of this investment will need to enhance infrastructure, improve labor skills, and boost manufacturing production.

2. Public investment in infrastructure in Bangladesh has been low averaging only about 2% of GDP and the long years of underinvestment have left a large part of the country’s population with poor access to basic infrastructure and services. The Global Competitiveness Report for 2014–2015 published by the World Economic Forum assigned Bangladesh an infrastructure ranking of 127 among 144 countries.<sup>3</sup> Poor infrastructure is an obstacle to faster and more inclusive economic growth because it (i) reduces the incentives for domestic and foreign investment; and (ii) restricts the country’s participation in South Asian regional trade, even though its strategic location makes it a potential regional transport and transshipment hub.<sup>4</sup> The frequent power shortages affecting industrial output due to the nation’s inadequate electricity infrastructure reduce GDP by an estimated 2% every year.<sup>5</sup>

3. To address these infrastructure deficiencies, the Seventh Five-Year Plan, FY2016–FY2020 requires a total financing equivalent to around Tk31.9 trillion, which is almost twice the size of Bangladesh’s GDP. Mobilizing financing from both the private and public sectors is critical to successfully accelerating investments in infrastructure. The government lacks the fiscal resources to finance the country’s infrastructure development on its own, and meeting the five-year plan targets will require substantial investment and implementation input from the private sector through public–private partnerships (PPPs).

### II. Infrastructure Financing in Bangladesh

4. Commercial banks act as an engine of growth in any economy, but in Bangladesh they have limited exposure to the infrastructure sector. As of the end of FY2012, only slightly more than 3% of the loans and advances by scheduled banks were in what could be considered infrastructure sectors.<sup>6</sup> The banking sector’s exposure norms and asset-liability structure generally limit banks from investing in infrastructure. Given that banks in Bangladesh are subject to existing single borrower exposure limit of 15% of total capital, it has been observed

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<sup>1</sup> World Bank. 2016. *Bangladesh Development Update: Moving Forward with Fading Tailwinds*. Dhaka.

<sup>2</sup> Government of Bangladesh, Planning Commission. 2015. *Seventh Five Year Plan FY2016–FY2020: Accelerating Growth, Empowering Citizens*. Dhaka.

<sup>3</sup> K. Schwab. 2014. World Economic Forum. The Global Competitiveness Report 2014–2015. [http://www3.weforum.org/docs/WEF\\_GlobalCompetitivenessReport\\_2014-15.pdf](http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf) (accessed 16 November 2016).

<sup>4</sup> Due to its comparatively inadequate transport infrastructure, the average cost of Bangladesh exports is estimated to be 80% above that of other South Asian countries and the costs of its imports 35% higher.

<sup>5</sup> ADB. 2011. *The Comprehensive Private Sector Assessment of Bangladesh*. Dhaka.

<sup>6</sup> N. Sultana and Md. J. Uddin. 2013. Financing in Infrastructure and Energy Sectors and Issuance of Bonds in Bangladesh: Problems and Prospects. *Bangladesh Bank Working Paper Series*. No. 1306. Dhaka: Bangladesh Bank.

that projects above \$70–\$100 million are difficult to finance in the domestic debt market. The average level of investment capacity of a single bank is only around \$20 million, which is too small to finance any large infrastructure or energy sector project. Moreover, commercial banks are largely limited to originating loans with a maximum term of 5–7 years and generally require equity levels of 25%–35%.

### **III. Role of Infrastructure Development Company Limited**

5. The Infrastructure Development Company Limited (IDCOL), a nonbank financial institution established by the government in 1997, plays a strategic role and mitigates risk in infrastructure financing by bridging the financing gap for medium- and large-scale infrastructure development and renewable energy projects. IDCOL has access to long-term funding resources from international financial institutions (such as ADB and World Bank) and provides long-term debt financing to viable privately owned and operated infrastructure projects in a variety of sectors. It also channels grants and concessional loans to reduce the cost of renewable energy infrastructure projects to develop off-grid electrification in rural areas.

6. IDCOL mainly funds greenfield projects that are implemented by the private sector or through PPPs. The projects must meet eligibility criteria, including requirements that they align with government priorities, are economically and financially viable, and undergo environmental and social assessments. IDCOL approves loans only on a limited recourse basis but has extended full recourse-based financing for renewable energy projects with a high developmental impact, such as its solar home systems (SHS) program. IDCOL has a separate credit policy and detailed strategy guidelines for loan appraisals and approvals. IDCOL can extend credit facilities only to a local corporate entity under the company's investment guidelines. In cases where foreign sponsors seek credit facilities from IDCOL, they must form a local project company. IDCOL's loan application and review process is detailed and comprehensive. It includes the preparation of an economic analysis for each subproject to be eligible for funding under the ADB facility. Only those with an economic internal rate of return (EIRR) of at least 12% are considered eligible for funding by ADB.

### **IV. Financing Medium- and Large-Scale Infrastructure Projects through Public–Private Partnership**

7. Based on the indicative list provided by IDCOL to the Asian Development Bank (ADB) of potential medium- and large-sized infrastructure subprojects to receive funding under ADB's Third Public–Private Infrastructure Development Facility, many are in the energy, road, and port sectors. These are sectors that have been prioritized by the government for funding through the PPP modality. The PPP program is part of the government's effort under its Vision 2021 to ensure more rapid and inclusive growth and the delivery of high-quality public services in a fiscally sustainable manner.<sup>7</sup>

8. The proposed ADB facility aims to spur investment, economic growth, employment, and financial sector development. Private sector investors will have access to an ADB credit line through IDCOL to finance infrastructure. This financing is intended in turn to (i) contribute to an enhanced investment climate, and support further investment and South Asian regional

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<sup>7</sup> Government of the People's Republic of Bangladesh. Perspective Plan of Bangladesh 2010–2021: Making Vision 2021 A Reality. [http://bangladesh.gov.bd/sites/default/files/files/bangladesh.gov.bd/page/6dca6a2a\\_9857\\_4656\\_bce6\\_139584b7f160/Perspective-Plan-of-Bangladesh.pdf](http://bangladesh.gov.bd/sites/default/files/files/bangladesh.gov.bd/page/6dca6a2a_9857_4656_bce6_139584b7f160/Perspective-Plan-of-Bangladesh.pdf) (accessed 16 November 2016).

integration; (ii) increase industrial output by improving the supply of power and access to markets; (iii) enhance economic activity and thereby increase employment; and (iv) create a better environment for expanding project finance activities in Bangladesh by catalyzing more private sector investment and strengthening the finance sector.

## V. Financing Renewable Energy Facilities

9. About 60% of urban households in Bangladesh have an electricity connection, compared with 33% in rural areas. About 69% of enterprises in rural areas report no access to electricity at all, and those that are connected suffer frequent power outages and surges and the significant costs that result.<sup>8</sup> Only 2% of the 3 million rural enterprises own a generator. Meanwhile, rising per capita consumption is increasing the country's overall electricity supply shortage growing at 10%–12% a year, based on estimates by the Bangladesh Power Development Board (BPDB).

10. Chronic power shortages and the peak power supply deficit force consumers and businesses who have diesel-powered electricity generators to use them, driving up their energy supply costs and creating additional greenhouse gas emissions.

11. The government aims to increase diversification in the country's fuel mix. By 2030, it hopes to reduce the share of coal to 50.0% from 2.5% in 2013, reduce the share of gas from 64.5% to 25.9%, and increase the share of renewable energy to 25.0% from 2.3%. It plans to increase financing for renewable energy projects to provide power to rural and off-grid populations and mitigate climate change risks. ADB's proposed Third Public–Private Infrastructure Development Facility will help reduce fossil fuel consumption and emissions by financing the provision of power from renewable sources to rural and off-grid rural households and enabling them to replace their kerosene lamps with electric ones. This will also raise the economic productivity of rural beneficiaries.

## VI. Sample of Economic and Financially Viable Infrastructure Projects Funded by ADB

12. **Bibiyana II Gas Power Project.** In June 2015, ADB, International Finance Corporation, and the Islamic Development Bank signed loan documents for providing a \$210 million financing to Summit Bibiyana II Power Company Limited (SBIIPCL) for the design, engineering, construction, and operation of two 341 megawatt (MW) combined cycle gas-fired power plants in Sylhet., in the district of Habiganj. ADB cofinanced the loan for up to \$75 million for a tenor of 14 years. The project aims to alleviate power shortages and help the government meet its goals of expanding the country's installed generation capacity to 20,000 MW and providing electricity to an additional 3 million consumers by 2020.<sup>9</sup>

13. Based on economic analysis conducted for the project, the base case EIRR was estimated at 18%, i.e. exceeding the real social discount rate of 12% and, therefore, considered as economically viable. Reductions in unplanned power interruptions will benefit the Bangladesh economy—the industry sector losses attributable to unplanned electric power interruptions average \$0.83 per kilowatt-hour. Also, utilizing indigenous natural gas from close and directly connected gas field in operation, the project was one of the least costly and highly efficient

<sup>8</sup> World Bank. 2009. Policy Research Working Paper 4859. *Welfare Impacts on Rural Electrification*. Washington, DC. Available at <http://library1.nida.ac.th/worldbank/fulltext/wps04859.pdf>

<sup>9</sup> ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Government of the People's Republic of Bangladesh for the Summit Bibiyana II Power Company Limited Bibiyana II Gas Power Project*. Manila.

options for additional power generation in Bangladesh.<sup>10</sup>

14. **Meghnaghat Power Project.** The Meghnaghat Power Project, partly funded by IDCOL, involved the construction and operation of a 450 MW combined-cycle gas-fired power plant in southeast Dhaka. In 2000, ADB approved (i) a direct loan of \$50 million and a complementary financing scheme loan of \$20 million to Meghnaghat Power Limited (MPL) for the project as part of a nonsovereign operation; and (ii) a political risk guarantee of \$70 million for the project.<sup>11</sup> Several financial institutions and commercial banks cofinanced the project. IDCOL provided in parallel with ADB a \$80 million loan to MPL for the project. At the time, this was the largest loan ever provided by a Bangladesh financial institution. The project was developed under a build-own-operate model with an implementation agreement between the government and MPL, and a power purchase agreement with the BPDB for all the electricity generated to be delivered to the BPDB grid for 22 years on a take-or-pay basis.

15. The project was constructed at a cost of \$289.6 million, or about \$10 million below the initial estimate at loan appraisal. However, based on an ADB project performance evaluation report (PPER) at completion, the project cost was lower than what was estimated by almost 2% due to unused contingencies and savings in project implementation and management costs that resulted from efficient and transparent international bidding.<sup>12</sup> The PPER reported that the dispatch factors were lower than the original estimates, which did not consider seasonal factors, and that this meant that energy charges were also lower than the original projections. Due to overestimates of the dispatch factors, gas take-or-pay charges were higher than the original projections. However, the PPER determined that these charges did not affect Meghnaghat Power's financial results, since they were passed through and reflected in the supplemental charge component of tariffs.

16. Since the Meghnaghat power plant's operations in November 2002, the Government was purchasing electricity from the plant at a price below 2 cents per unit. However, with the unforeseen steep increases in the values of energy in the international markets over the next 8 years, the recalculated EIRR in the PPER of 14% was therefore significantly lower than the loan appraisal estimate of 27% but remained above the accepted threshold of 12%.<sup>13</sup>

17. **Bangabandhu Jamuna Multipurpose Bridge Project.** Opened in June 1998, the Bangabandhu or commonly called the "Jamuna Bridge" is the longest bridge in Bangladesh and the fifth longest in South Asia. It provides a strategic link between the eastern and western parts of the country. The bridge was constructed at a cost of \$962 million. ADB, together with the World Bank, and the Japan International Cooperation Agency provided equal 22% shares in the financing and the government provided the remaining 34%.<sup>14</sup>

18. ADB noted in its completion report in 2000 that the bridge had lifted 1 million people out of poverty and significantly reduced transport costs and resulted in a marked improvement of trade flows.<sup>15</sup> The project had also brought about noticeable in the country's northwest region by

<sup>10</sup> ADB's Private Sector Operations Department undertook an internal economic analysis of the proposed project in 2014.

<sup>11</sup> ADB. 2008. *Extended Annual Review Report: Loans and Political Risk Guarantee for the Meghnaghat Power Project in Bangladesh*. Manila.

<sup>12</sup> ADB. 2009. *Performance Evaluation Report: Meghnaghat Power Project to the Government of the People's Republic of Bangladesh*. Manila.

<sup>13</sup> ADB. 2009. *Performance Evaluation Report: Meghnaghat Power Project in Bangladesh*. Manila.

<sup>14</sup> ADB. 1996. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the People's Republic of Bangladesh for the Jamuna Bridge Access Roads Project*. Manila.

<sup>15</sup> ADB. 2000. *Completion Report: Jamuna Bridge Project in Bangladesh*. Manila.

increasing the region's exports of goods and labor and made it a more attractive location for processing plants. Improvements made between 1998 and 2000 in the northwest included increases in passenger commuting (18%), the volume of interregional trade (5%), and truck (89%) and bus (130%) traffic. Lower transport costs due to the bridge and better access to more profitable markets had led to increased prices for farm products and substantially added to the farmers' income. The bridge had also helped bring about major investments in the region's cement and transport industries.<sup>16</sup> On project completion, the economic rate of return was recalculated at 17% using the same methodology at appraisal and higher than the initial estimate of 15%, thereby, confirming the positive effects of the higher-than-estimated traffic on the bridge despite the higher than initially estimated tolls set by the Government.<sup>17</sup>

19. **IDCOL's solar home systems program.** Under its Second Public–Private Infrastructure Development Facility approved in 2013, ADB provided a \$10 million Asian Development Fund loan to IDCOL for onlending in local currency for IDCOL's SHS program to finance the installation of solar-powered home energy systems.<sup>18</sup> Under the on-going SHS program, consumers obtain micro loans from participating nongovernmental organizations, microfinance institutions, and/or private sector companies that install the system per IDCOL's technical standards. These organizations then apply for refinancing from IDCOL. The refinancing provides the participating organizations with funds to install more systems in remote areas. ADB is one of several development partners supporting IDCOL's SHS. Others include the Department for International Development of the United Kingdom, GIZ International Services, the Global Partnership of Output-Based Aid, the Japan International Cooperation Agency, the Islamic Development Bank, KfW, the United States Agency for International Development, and the World Bank.

20. This program is one of the largest and fastest growing off-grid electrification initiatives in the world. IDCOL reported that about 3.74 million SHSs had been installed in the off-grid areas by the end of 2015 with the program's support, and 17 million people—about 11% of the country's population—were benefitting from the solar-power electricity provided. The SHS program replaces 179,520 tons of kerosene worth an estimated \$153 million each year and has helped directly create more than 75,000 jobs. It has resulted in annual carbon dioxide reductions of 424,008 tons and led to the development of local support industries. The program has saved the government the more than \$1 billion that it would have otherwise had to spend on extending power grid connections to the households now serviced by SHSs. IDCOL aims to have financed the installation of 6 million SHSs with an estimated generation capacity of 198MW of electricity by 2020.

21. The World Bank carried out an economic and financial analysis based on the supply and installation of 550,000 SHSs of varying capacity for a period of about 15 months, beginning in January 2013. The pace of installation was conservatively assumed to be at about 38,000–40,000 per month, with about 25,000 SHSs per month funded directly by the World Bank—the balance would use other sources of funds available to IDCOL and its partner organizations. From a project economic and financial viewpoint, the World Bank estimated high and robust internal rates of return (IRR). Even without considering consumer surplus benefits, the EIRR is 43%, while the financial IRR is 26%.<sup>19</sup>

<sup>16</sup> ADB. 2013. *Bangladesh–ADB: 40 Years of Development Partnership*. Manila.

<sup>17</sup> ADB. 2000. *Completion Report: Jamuna Bridge Project in Bangladesh*. Manila.

<sup>18</sup> ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the People's Republic of Bangladesh for the Second Public–Private Infrastructure Development Facility*. Manila.

<sup>19</sup> World Bank. 2012. *Bangladesh—Second Rural Electrification and Renewable Energy Development Project*. Washington, DC.