SECTOR ASSESSMENT (SUMMARY): AGRICULTURE, NATURAL RESOURCES AND RURAL DEVELOPMENT[1]

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. Agricultural development and sustainable natural resource management are critical for poverty reduction, as the majority of poor people in Bangladesh (85%) live in rural areas and depend on agriculture for their livelihood. Agriculture generates 50% of employment, contributes 20% of gross domestic product, and provides a secure food supply for the whole population. Fostering agricultural development and sustainable natural resource management has taken on increased importance in recent years as policy makers grapple with climate change and sudden spikes in food prices.

2. Agricultural growth is driven by a shift from subsistence rice-based cultivation to commercial high-value agriculture commodities, which is instrumental in advancing rural economic growth and contributing to long-term food security. The Government of Bangladesh promotes diversification in agriculture by encouraging private agribusiness as well as providing access to, and improving, rural infrastructure. Investments in rural infrastructure provide an opportunity to build technical skills and develop capacity within local governments, and have a gender equality dimension. Rural infrastructure includes farm-to-market roads, power-related infrastructure, growth centers that provide marketplaces and should include women's sections, water supply and sanitation, and infrastructure related to water resource management. Major causes of poverty are recurrent floods and riverbank erosion, as well as drainage congestion, salinity, cyclones and tidal surges, arsenic contamination, overexploitation of groundwater, chemical and biological contamination of surface water, and drought. To deal with drought, extensive irrigation facilities have been constructed, including privately owned and operated groundwater abstraction technologies, and large publicly owned and financed surface water irrigation schemes (larger than 2,000 hectares [ha]).

3. Large irrigation systems in Bangladesh suffer from inefficient water utilization and inadequate maintenance, and there is a large backlog of needed repairs. Climate change is expected to affect the future incidence and severity of disasters, necessitating more attention to managing disaster risk and adapting to change. More effort is required to foster community participation in sustainable management so as to include women and the private sector. The productivity of large irrigation schemes continues to be weakened by inadequate operation and maintenance (O&M), so that the infrastructure of most large schemes needs rehabilitation. This weakness is due to inadequate financing,[2] lack of beneficiary participation in management, and poor service delivery. The present low performance may be aggravated in future by changes in temperature and rainfall patterns due to climate change. Such risks need to be considered when rehabilitating the infrastructure and modernizing system operations.

4. The government provides distribution systems down to secondary or tertiary levels for 15 existing large irrigation schemes, with a total command area of around 550,000 ha.[3] For the

---

[1] This summary is based on Asian Development Bank (ADB). 2011. *Country Partnership Strategy: Bangladesh, 2011–2015*. Manila.

[2] Funds provided by the government for maintenance of these schemes is less than 50% of requirement and irrigation service charges collected from end users amounts to only about 10% of the assessed amount.

[3] Government of Bangladesh. 2000. National Water Management Plan. Volume No 3: Investment Portfolio. Ref AW001.

period 1996–1998, only about 46% of the net command area was irrigated from Bangladesh Water Development Board (BWDB) sources in the main irrigation season, and there is little evidence of improvement since then. Increasing the areas irrigated and recovering fees would assist economic growth through increased production and reduced subsidies. Also, developing sustainable approaches to management and operation of existing schemes would provide a sound basis for new schemes. The National Water Management Plan (2001) identified an additional 1 million ha that could be irrigated with new surface water schemes in areas where tubewell irrigation is limited.

5. The road map for the Irrigation Management Improvement Project has been prepared in the context of existing well-developed policy, legal, institutional, and planning frameworks for the water subsector. It is designed to assist the government in modernizing and rehabilitating the infrastructure of existing major irrigation schemes, and to introduce public–private partnership (PPP) models. It also envisages an improved relationship between irrigators and scheme managers based on advance payment for timely and efficient service delivery. The approach is adapted from the system currently used by the Barind Multipurpose Development Authority (under the Ministry of Agriculture) for sustainable management and operation of deep tubewell irrigation for more than 100,000 ha.

2. Government's Sector Strategy

6. The National Water Policy, adopted by the government in 1999, sets out a comprehensive policy framework for the water sector as a whole and for large surface water irrigation schemes. According to the policy, (i) stakeholders in future schemes are to have a high degree of participation in planning, design, construction, and operation; (ii) poor and other vulnerable persons are to have equitable access to water; (iii) women are to have an enhanced role in water management; (iv) scheme management is to be decentralized to the lowest appropriate level in accordance with basic integrated water resources management principles; and (v) social and environmental issues are to be properly managed. Future schemes are envisaged to be under private management through leasing, concession, or management contracts, or they are to be jointly managed by the scheme's implementing agency along with local government and community organizations. The policy envisages sufficient knowledge and capability in the country to design, through broad public participation, water management plans with economic efficiency, gender equity, social justice, and environmental awareness contributing to the national objectives.

7. The government's Sixth Five Year Plan, fiscal year (FY) 2011–FY2015 recognizes the need to raise agricultural productivity, foster crop diversification, and boost public spending on rural infrastructure. The plan also presents a strategic direction for medium-sized and large surface water irrigation schemes. At its highest level, the strategy focuses firstly on achieving the intended benefits of existing irrigation schemes through modernization and improved management, and secondly on pursuing irrigation expansion while applying the lessons of improvements to existing schemes. To reduce public costs associated with sustainably operating these schemes, and to improve service delivery, the proposed strategy is to establish PPPs wherever appropriate. Where PPPs are not appropriate, reliance should be placed on improving the quality of the services delivered by the BWDB and on technologies to measure water applied to farmers' fields. To improve services it is necessary to (i) field staff with basic skills required for sustainable delivery of irrigation services; (ii) provide training in participatory water management; and (iii) directly involve irrigators in decision making for system management, operation, and maintenance. Table 1 present's the government's subsector investment plan to modernize and upgrade major surface water irrigation schemes, for which

the Irrigation Management Improvement Project will contribute to expanding and modernizing existing areas irrigated by major infrastructure.

Table 1: Investment Plan for Major Irrigation Infrastructure

Item	Total Amount[a]
Net cultivated area ('000 ha)	7,700
Net irrigated area ('000 ha)[b]	4,850
Command area of large infrastructure ('000 ha)	552
Present area irrigated by large infrastructure ('000 ha)	254
Potential for new major irrigation schemes ('000 ha)	1,178
Investment for Modernization	
Estimated modernization requirement ($ million)[c]	745
Government-approved investment ($ million)[d]	2
IMIP contribution to modernization ($ million)[e]	128
Outstanding	615
IMIP contribution towards overall requirements	17%

IMIP = Irrigation Management Improvement Project
Notes: a National Water Management Plan Estimates
b Source: Bangladesh Bureau of Statistics. 2011. Yearbook of Agricultural Statistics
c Project Preparatory Technical Assistance consultant estimate based on investment of $1,350/hectare
d Source: Bangladesh Water Development Board chief monitoring unit, February 2013
e The total Irrigation Management Improvement Project investment is $59.60 million, with physical investments (civil works) of $30.36 million at 2013 prices. In addition, the project will prepare feasibility and detail designs for investments estimated at about $150 million.
Source: ADB

3. ADB Sector Experience and Assistance Program

8. The overarching objective of Asian Development Bank (ADB) support is to contribute to the government's goals as stated in its Sixth Five Year Plan and its commitment to enhancing growth and reducing poverty by boosting private sector investment, developing infrastructure, and enhancing the productive resources of the rural poor, among other things. Investment in infrastructure development is to include substantial private sector participation through PPPs. Towards this objective, ADB's country partnership strategy (CPS)[4] provides assistance within its Strategy 2020[5] agendas of inclusive economic growth, environmentally sustainable growth, and regional integration. The strategy for public sector operations focuses on six sectors, of which agriculture and natural resources is one, and includes improving management of water resources. For delivering high-impact results and better addressing constraints on growth, ADB will support larger strategic projects and programs, including projects requiring advanced technology. The CPS identifies seven thematic drivers, of which the following are relevant to surface irrigation: (i) good governance and capacity development, (ii) environmental sustainability and climate resilience, (iii) private sector development, and (iv) gender equity.

9. In the agriculture and natural resources sector, to support the government's objectives for rural poverty reduction, flood security, and gender equity the CPS focuses on ensuring sustained high growth in agriculture with ADB assistance for rural infrastructure and innovative approaches to water resources management. Support for rural infrastructure will aim to boost productivity and foster rural transformation, while support for the efficient, integrated, and sustainable management of water resources will adopt a programmatic approach to scale up ADB's support for piloting new institutional approaches involving PPPs to improve the

[4] ADB. 2011. *Country Partnership Strategy: Bangladesh, 2011-2015.* Manila.
[5] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020.* Manila.

management of large irrigation schemes. The objectives are increased efficiency in water use, increased private sector and community participation, and improved irrigation service delivery with increased accountability to farmer organizations. This approach is consistent with ADB's Water Operational Plan, 2011–2012[6] and Water for All policy.[7]

10. Modernized irrigation infrastructure and management can contribute significantly to mitigating drought-related risks associated with a changing climate. Additionally, ADB support will introduce PPPs that are expected to (i) promote the empowerment of beneficiaries by decentralizing scheme management, (ii) support an enhanced role for women in water management, (iii) enable equitable access to irrigation water, and (iv) reduce public costs associated with major irrigation schemes by establishing self-financing operation and maintenance mechanisms.

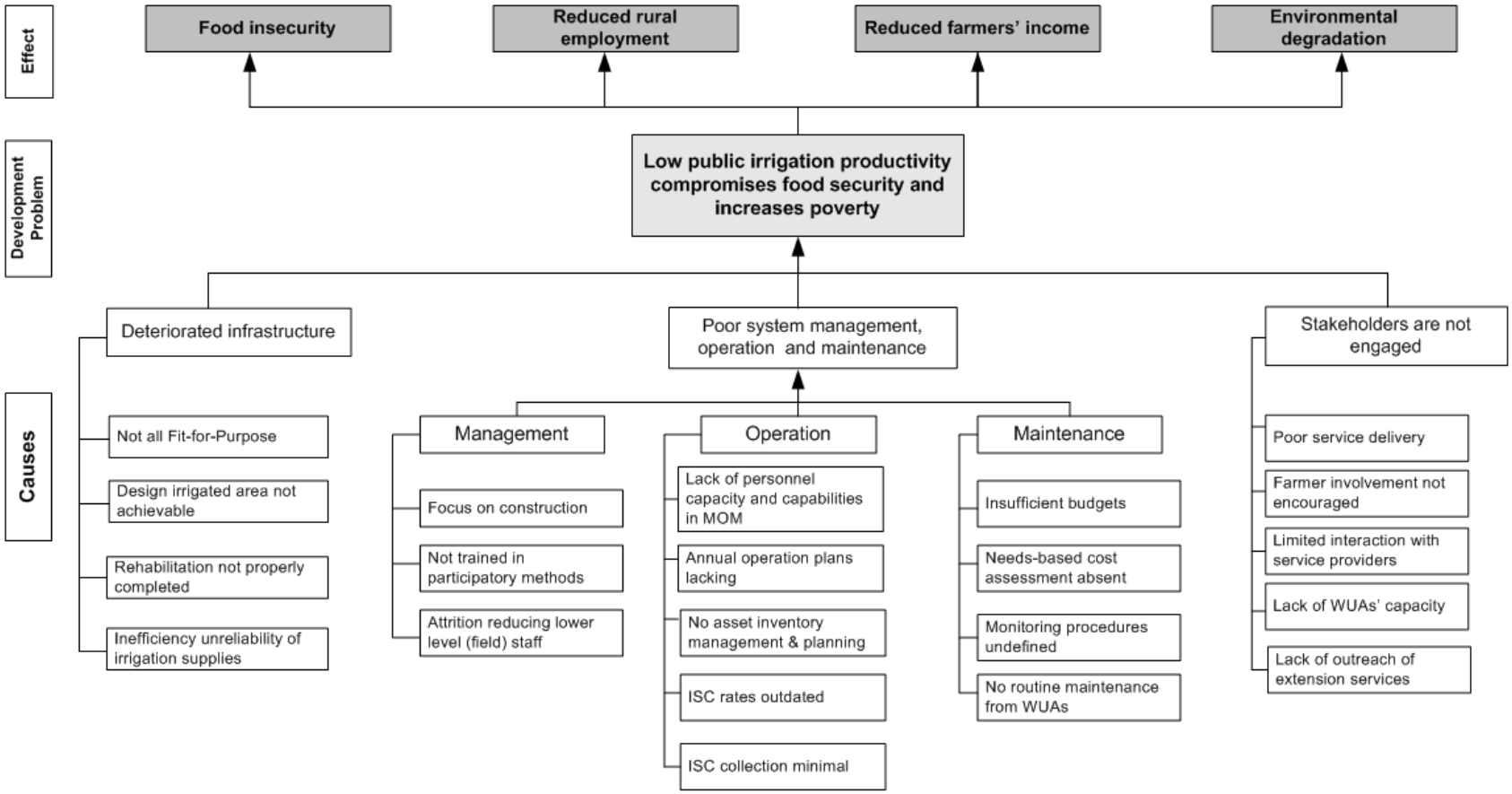
11. Despite having a water policy framework that strongly supports the government's agenda for major surface water irrigation schemes, performance in the subsector has been mediocre. Irrigation infrastructure is affected by insufficient maintenance stemming from inadequate budgets, the absence of need-based O&M cost assessments, undefined monitoring procedures, and little support for routine maintenance from local water management organizations. System management and operation is further affected by capacity within the BWDB, where staff levels have been reduced and remaining staff are not well versed in participatory methods and have a bias towards managing construction, which in turn distracts them from developing capability in management, operation, and maintenance.

12. With ADB's support, the government completed the First Command Area Development Project in 2003, and then requested ADB's support to prepare the Second Command Area Development Project aimed at improving the performance of large flood-control drainage and irrigation schemes. During preparation, two principal constraints on sustainable performance of major water schemes were identified: (i) limited capacity and resources of public agencies in effective maintenance of public agencies in managing O&M of large irrigation schemes, and (ii) major system deterioration as a result of inadequate O&M planning and financing mechanisms. In response, ADB provided capacity development technical assistance—Developing Innovative Approaches to Management of Major Irrigation Schemes[8]—completed in 2011. It recommended innovative irrigation service delivery and management arrangements using PPPs to improve large irrigation scheme management, operation, and maintenance, particularly for the Muhuri Irrigation Project. This concept has been further developed and will be implemented under the Irrigation Management Improvement Project. Similar management innovation and infrastructure modernization will be applied to the Teesta Irrigation Project and Ganges-Kobadak Irrigation Project feasibility studies and detail design financed under the project.

13. With the Irrigation Management Improvement Project, ADB is taking the lead in the large irrigation subsector, with the intention of piloting and demonstrating sustainable management, operation, and maintenance and attracting other donors for cofinancing.

[6] ADB. 2012. *Water Operational Plan, 2011–2020*. Manila.
[7] ADB. 2003. *Water for All: The Water Policy of the Asian Development Bank*. Manila.
[8] ADB. 2009. *Technical Assistance to Bangladesh for Developing Innovative Approaches to Management of Major Irrigation Schemes*. Manila.

Problem Tree for Agriculture, Natural Resources and Rural Development (Irrigation Subsector)



ISC = irrigation service charge, MOM = management, operation and maintenance, WUA = water user association

Sector Results Framework (Agriculture and Natural Resources - Irrigation Subsector, 2011–2015)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Opportunities	
Outcomes with ADB Contribution	**Indicators with Targets and Baselines**	**Outputs with ADB Contribution**	**Indicators with Incremental Targets**	**Planned and On-going ADB Interventions**	**Main Outputs Expected from ADB Interventions**
Sustained high growth in agriculture	Agricultural growth remaining at 4.5% on average from 2011 to 2015	Agricultural infrastructure and systems expanded and improved	2,000 km of rural roads upgraded by 2015 Additional 158 km of riverbank protected and 142 km of existing river bank protection upgraded by 2015	**Planned Key Activity Areas** Rural infrastructure development and integrated water resource management, including flood control and protection of irrigation systems and riverbanks **Pipeline Projects** Chittagong Hill Tracts Rural Development ($55 million) Climate Resilient Rural Infrastructure Improvement ($50 million) Irrigation Management Improvement Project ($46 million) Main River Flood and Bank Erosion Risk Management Program (total $410 million, ADB $250 million) Southwest Integrated Water Resource Management (supplementary, $20 million) Second Sustainable Rural Infrastructure Improvement ($75 million) **Ongoing Projects** Agribusiness Development ($42.5 million) Participatory Small-Scale Water Resources Sector ($55 million) Second Rural Infrastructure Improvement ($96.1 million) South West Integrated Water Resources Management ($20 million) Sustainable Rural Infrastructure Improvement ($60 million)	8,000 m of bridges and culverts constructed 300 rural markets improved, with 134 women's market sections 100 km of riverbanks vulnerable to erosion protected and rehabilitated to protect farmland, adopting low-cost riverbank protection technology using geotextiles 57,000 ha of land under improved flood control, drainage, and irrigation 50,000 ha converted to high-value crop production and 10,000 demonstration plots for high-value crops established

ADB = Asian Development Bank, ha = hectare, km = kilometer, m = meter, MFF = multitranche financing facility.
Source: Asian Development Bank.