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West Bengal Accelerated Development of Minor Irrigation Project – Phase II (P177876)

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# Project Information Document (PID)

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Appraisal Stage | Date Prepared/Updated: 11-Apr-2023 | Report No: PIDA33276



## BASIC INFORMATION

### A. Basic Project Data

Country India	Project ID P177876	Project Name West Bengal Accelerated Development of Minor Irrigation Project - Phase II	Parent Project ID (if any)
Region SOUTH ASIA	Estimated Appraisal Date 17-Mar-2023	Estimated Board Date 25-May-2023	Practice Area (Lead) Water
Financing Instrument Investment Project Financing	Borrower(s) India	Implementing Agency DWRID, Government of West Bengal	

#### Proposed Development Objective(s)

The PDO is to augment water availability and strengthen water user associations for improved irrigated agriculture in project areas of West Bengal.

#### Components

- A. Strengthening community-based institutions
- B. Minor irrigation services
- C. Agricultural support services
- D. Project management and technical support

## PROJECT FINANCING DATA (US\$, Millions)

### SUMMARY

Total Project Cost	211.00
Total Financing	211.00
of which IBRD/IDA	148.00
Financing Gap	0.00

### DETAILS

#### World Bank Group Financing



International Bank for Reconstruction and Development (IBRD)	148.00
<b>Non-World Bank Group Financing</b>	
Counterpart Funding	63.00
Borrower/Recipient	63.00
Environmental and Social Risk Classification	
Moderate	
Decision	

Other Decision (as needed)

## B. Introduction and Context

### Country Context

1. ***India's growth is expected to moderate in FY23/24 to 6.3 percent, from an estimated 6.9 percent in FY22/23, due to easing consumption growth and global growth spillovers.*** Despite the global growth slowdown, real GDP is expected to have expanded by 6.9 percent in FY22/23.<sup>1</sup> This robust growth was underpinned by buoyant private consumption in the first half of FY22/23 and strong expansion in investment activity supported by a sustained increase in public capital spending. In contrast, government consumption growth moderated due to the central government's commitment to reduce current spending. Robust domestic demand and elevated food prices kept headline inflation above the Reserve Bank of India's tolerance range (2 – 6 percent) in FY22/23. The growth momentum eased in the second half of FY22/23 as high inflation, higher borrowing costs and global spillovers weighed on domestic demand and dampened exports growth. Real GDP growth is expected to moderate further to 6.3 percent in FY23/24. Consumption is likely to be constrained by rising borrowing costs, slower growth in incomes and continued fiscal consolidation. The government's sustained investment push, healthy corporate profits, and a reduction in bank NPLs will likely buoy investment despite reduced risk appetite and elevated input costs. Slowing imports growth and ongoing strength in services exports is expected to contribute to a narrowing of the current account deficit to 2.1 percent of GDP in FY23/24. Despite the increased public investment, the government is likely to continue pursuing fiscal consolidation. The general government deficit will decline to 8.7 percent in FY23/24 (9.4 percent: FY22/23), due to lower current spending and modest revenue growth, reflecting the withdrawal of pandemic-related support programs. The current level of the fiscal deficit stabilizes the debt-to-GDP ratio around 83 percent.

<sup>1</sup> World Bank real GDP forecasts published in India Development Update, April 2023.



**India has made remarkable progress in reducing extreme poverty over the past two decades. The share of the population living below US\$2.15 per person per day (2017 PPP) is estimated to have halved between 2011 and 2019.**<sup>2</sup> This was accompanied by a sharp decline in the incidence of multidimensional poverty, from 27.7 percent in 2005/06 to 16.4 percent in 2019/21.<sup>3</sup> However, the pace of poverty reduction has slowed in recent years, with key welfare indicators being slow to improve.<sup>4</sup> More recent estimates suggest that the pandemic induced spike in extreme poverty (\$2.15), of up to 4 percentage points, moderated in 2021-22. Facilitated by widespread access to vaccines, extreme poverty rates are estimated to have declined to 13.8 percent in 2021-22, although not as low as pre-pandemic levels. More than 40 percent of India's population lived below the lower-middle income poverty line even before the pandemic.<sup>5</sup> Inequality in consumption has remained stable, with a Gini index of around 35 over the past two decades. Child malnutrition has remained high, with 35.5 percent of children under the age of 5 being stunted and 67 percent of children aged 6-59 months being anemic in 2019-21.<sup>6</sup> Headline employment indicators have improved since 2020 but concerns about job quality and real wage growth remain.<sup>7</sup>

**West Bengal is India's second most densely populated state, and, with 96 million people, also its fourth most populous.** The state is the sixth largest contributor to India's net domestic product. The annual average growth rate of real gross state domestic product (GSDP) for the state was 6.4 percent in the five years between FY15/16 and FY19/20, in line with the national average. Despite the COVID-19 outbreak and the impact of Cyclone Amphan, the state's economy did not contract in FY20/21 and growth recovered in FY21/22. According to the provisional accounts for FY21/22, published by the Office of the Comptroller and Auditor General (CAG), the fiscal deficit moderated to 3.3 percent of GSDP, from 3.4 percent in FY20/21, owing to a recovery in revenues and lower-than-budgeted spending. The percentage of the population below the poverty line is 20 percent. However, there is significant variation within the state, with some districts showing much higher poverty rates in the range of 31 to 38 percent, especially in rural areas which remain much poorer than the cities. Due to the large size of the state's population, West Bengal also harbors the fourth largest absolute number of poor people among India's states.<sup>8</sup>

**West Bengal is facing significant vulnerabilities to current and future climate change.**<sup>9</sup> Over the past decades, most of the districts in West Bengal have experienced increasing annual temperatures and decreasing annual precipitation, albeit with high spatial variability characterized by opposite trends in neighboring districts. By 2030, the state is likely to experience maximum and minimum temperature rises at different rates, leading to a warmer weather with smaller diurnal differences. The weather pattern is expected to become more erratic, with heavy precipitation events and an increasing frequency of floods, cyclones, and droughts. The overall amount of water available from precipitation is expected to decline by

<sup>2</sup> Estimates are based on the methodology documented in a World Bank Policy Research Working paper by Roy and van der Weide (2022), which relies on imputed consumption from the Consumer Pyramid Household Surveys (CPHS) implemented by the Centre for Monitoring the Indian Economy, a private data company. The CPHS sample is re-weighted to make it more nationally representative. The series has been revised to incorporate recent survey years (Macro Poverty Outlook, Spring 2023). In 2004, India's extreme poverty rate was 39.9 percent using the same international poverty line. In 2011, this rate was 22.5 percent.

<sup>3</sup> UNDP (United Nations Development Programme), OPHI (Oxford Poverty and Human Development Initiative). 2022. 2022 Global Multidimensional Poverty Index (MPI): Unpacking deprivation bundles to reduce multidimensional poverty. New York.

<sup>4</sup> World Bank Poverty and Inequality Platform. <https://pip.worldbank.org/country-profiles/IND>.

<sup>5</sup> US\$3.65 per capita per day (2017 PPP). World Bank Poverty and Inequality Platform. <https://pip.worldbank.org/country-profiles/IND>.

<sup>6</sup> Government of India, Ministry of Health and Family Welfare, 2022. National Family Health Survey (NFHS - 5), 2019–21 report.

<sup>7</sup> World Bank Macro Poverty Outlook. Spring 2023. Estimates from PLFS data.

<sup>8</sup> World Bank, West Bengal Poverty, Growth and Inequality, June 20, 2017.

<sup>9</sup> Government of West Bengal, West Bengal State Action Plan on Climate Change 2017–2020.

[http://www.environmentwb.gov.in/pdf/WBSAPCC\\_2017\\_20.pdf](http://www.environmentwb.gov.in/pdf/WBSAPCC_2017_20.pdf)



8–22 percent by 2030<sup>10</sup>, while the rate of evapotranspiration will increase, further exacerbating water scarcity.

#### Sectoral and Institutional Context

**Although West Bengal's agricultural sector contributes an estimated 20 percent to the GSDP and employs over 40 percent of the workforce, the average income of agriculture-dependent households is one of the lowest in India.** The state's main crops in terms of area under cultivation include rice (65 percent), oilseeds (11 percent), pulses (6 percent), jute (6 percent) and potato (4 percent). It is one of the most important food-producing states in India, accounting for nearly 15 percent of the rice (16 million tons in FY15–16) and 23 percent of the potato production (11 million tons in FY15). It is also one of the largest vegetable-producing states (with a national share of 20–40 percent) and the second largest fish-producing state. Its strategies for economic growth, poverty reduction, and employment creation thus depend to a large extent on the agricultural sector. However, the state has large tracts of backward districts and tribal-dominated areas where small and marginal farmers<sup>11</sup> are struggling with sustenance farming to meet their livelihoods. About 95 percent of the agricultural workforce in the state consists of small and marginal farmers, and the average income of agriculture-dependent households is INR 3,980 (US\$48) per household per month, significantly below the national average of INR 6,426 (US\$78).<sup>12</sup>

**The potential for improving farmer income through multi-seasonal crops and diversification has been constrained mainly by poor surface water availability and limited development of suitable irrigation systems.** West Bengal is richly endowed with water resources, but the state has not been harnessing it to serve the irrigation demand. The state has around 56 million ha in cultivable land that could utilize more than 70 billion cubic meters (BCM) annually in irrigation. While the state's annual rainfall averages at 1,740 mm (or 113 BCM), accounting for 7.5 percent of India's total, as much as 76 percent falls in the three to four monsoon months. This necessitates surface storage structures, but so far, the state has only been able to develop 19.8 BCM capacity. Instead, it has been more proactive in utilizing 42 percent of groundwater potential, 30 BCM in total, particularly in the northern and southern regions where alluvium aquifers are prevalent. Between 2005 and 2017, the number of semi-critical blocks<sup>13</sup> has increased from 5 to 19 (out of a total of 41 blocks)<sup>9</sup>. In general, this intense groundwater abstraction has increased the cost of cultivation and undermined sustainability of the underlying water resources. Further, 15 million ha (or 26 percent of the cultivable area) remains rain-fed due to a lack of irrigation systems, especially in the dry western regions where groundwater potential is low.

**Climate change is expected to amplify these challenges, posing threats to the state's natural resources and communities.** Decreasing precipitation and increasing evapotranspiration are expected to have an impact on plant physiology and productivity with significant consequences for agriculture. Climate change is also expected to have a negative impact on key stages of horticultural production and increase the vulnerability of the fisheries sector. Further, working in hotter weather can increase incidences of

<sup>10</sup> Government of India, NITI Ayog, 2019 , Composite Water index. [http://social.niti.gov.in/uploads/sample/water\\_index\\_report2.pdf](http://social.niti.gov.in/uploads/sample/water_index_report2.pdf)

<sup>11</sup> Mandala, S., D. Burmana, U. K. Mandala, T. D. Lamaa, B. Majia, and P.C. Sharmab. 2017. "Challenges, Options and Strategies for Doubling Farmers' Income in West Bengal – Reflections from Coastal Region." *Agricultural Economics Research Review* 30 (Conference Number): 89–100.

<sup>12</sup> Ibid.

<sup>13</sup> A semi-critical block is one where the groundwater table has on average been declining by over 0.2 m per year over a five-year period.



morbidity due to climate change-exacerbated extreme heat in farmers who work extended hours in the field.

**The Government of West Bengal (GoWB) has successfully completed the World Bank-supported West Bengal Accelerated Development of Minor Irrigation Project (Phase I, P105311) in 2019, which provides a successful model for developing minor irrigation schemes to enhance agricultural production.<sup>14</sup>** Considering challenges associated with the development of large-scale irrigation systems, farmer-led, small-scale irrigation development can be more efficient and effective in terms of time and impact.<sup>15</sup> In line with this approach, Phase I delivered irrigation services mainly through small storage structures (such as ponds and check dams) and tube wells, strengthened community-based irrigation by establishing 2,277 water user associations (WUAs) to promote ownership and ensure better operation and maintenance (O&M), encouraged crop diversification<sup>16</sup> and use of new technologies, and created new income-generating opportunities such as floriculture and fisheries. Overall, Phase I developed 40,000 ha command area of irrigation and reached about 125,000 beneficiaries, of which more than 100,000 were small and marginal farmers. An analysis after the completion of Phase I showed that it generated an incremental median income of INR 7,000 (US\$85) per household<sup>17</sup> in drought-prone areas, compared to schemes that did not benefit from project interventions. Given Phase I's accomplishments, the GoWB continued replicating its model after Phase I's closure, developing additional 600 WUAs and 15,000 ha command area of irrigation with its own finances but using systems and guidelines developed by the Bank project.

**Some of the successful models of Phase I have been scaled up also through the state's flagship programs.** The Jaltirtha Program launched in 2014–15 has invested around US\$80 million in the arid western districts to construct check dams, water harvesting structures and small ponds aiming to provide year-round irrigation to the communities. This program has been further strengthened by the Matir-Sristi Program, which was launched in 2020 by the GoWB in the face of the COVID-19 pandemic. It aims to support rural households' income through horticulture, fisheries, and animal husbandry development using fallow land and has now scaled up the mixed fruit plantation model introduced in Phase I. Notwithstanding the achievements of Phase I and Jaltirtha, reforms of institutions take time.

**The proposed West Bengal Accelerated Development of Minor Irrigation Project Phase II (the Project) builds on the success of Phase I particularly to streamline the innovative approaches introduced during Phase 1 in community based participation and technology based planning and monitoring.** Therefore, like Phase I, the Project will mobilize farmers to form and strengthen WUAs and deliver irrigation and agricultural services to unserved, climate-vulnerable farmer communities in the state. Moreover, given that many state-run schemes, including Jaltirtha, did not incorporate community-based approach and are, therefore, facing challenges in O&M of schemes, the Project will focus on helping the GoWB institutionalize gender-sensitive community-based participation at the Department of Water Resources Investigation and Development (DWRID), along with other Phase I accomplishments. **Despite the efforts made in Phase I,<sup>18</sup> the gender gap remains in the irrigation and agricultural sectors in West Bengal.** In India's eastern region,

<sup>14</sup> In India, minor irrigation refers to the structures that serve irrigation to a command area of less than 2,000 ha.

<sup>15</sup> World Bank. 2021. *The Farmer-led Irrigation Development Guide: A What, Why and How-to for Intervention Design*.

<sup>16</sup> Crop diversification in the project areas resulted in farmers growing different types of vegetables such as brinjal, cauliflower, leafy vegetables, onion, pumpkin, and ridge gourd. Mustard cultivation increased 7.5 times and area under potato cultivation increased 4 times in the project areas.

<sup>17</sup> This increment was earned from an average area of 0.3 ha.

<sup>18</sup> Phase I prioritized women's participation in WUAs and over 17,000 WUAs with women members were formally registered.



including West Bengal, women's participation in water-related community-level decision making bodies remains below 10 percent.<sup>19</sup>

### C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

The PDO is to augment water availability and strengthen water user associations for improved irrigated agriculture in project areas of West Bengal.

Key Results

The PDO will be evaluated against the following indicators:

- (a) Water harnessed through new irrigation schemes (cubic meters [CM] per year)
- (b) Beneficiaries provided with improved irrigated agriculture and allied services (number)
  - Of whom are small and marginal farmers (percentage)
  - Of whom are farmers belonging to tribal communities (percentage)
  - Of whom are female farmers (percentage)
- (c) Well performing WUAs operating and maintaining irrigation schemes successfully (percentage)
- (d) Value-weighted index<sup>20</sup> for agricultural outputs (fixed base price) (percentage).

### D. Project Description

The Project consists of the following components:

#### Component A: Strengthening community-based institutions

- (a) **Developing WUAs for new schemes.** The component will, among other things, sensitize, mobilize, and establish new WUAs and support them in developing their skills and

<sup>19</sup> Khandekar, V. 2020. "Gender Perspective in Water Management: The Involvement of Women in Participatory Water Institutions of Eastern India". *Water Journal*.

<sup>20</sup> This composite indicator will account for intensification, diversification to high-value crops, and productivity, estimated as the ratio of the composite value at post implementation and baseline. The unit price of each commodity will be fixed at base price so that price inflation will not affect the indicator. Where, VWI: Value weighted index, A=area, Y=yield and P=Price of commodity, n=type of commodities and t=year of measurement post project and 0 is baseline.

$$VWI = \frac{\sum_{i=1}^n (A_{i,t} Y_{i,t} P_{i,0})}{\sum_{i=1}^n (A_{i,0} Y_{i,0} P_{i,0})}$$



competencies to plan, operate, and manage irrigation schemes. This will include establishing governance procedures and social accountability mechanisms, developing equitable and sustainable water sharing and utilization systems, and developing as well as implementing their respective Scheme Cluster Development Management Plans (SCDMPs).

- (b) **Strengthening WUAs for existing schemes.** The component will, among other things, map and assess WUAs' performance; recommend and implement organizational strengthening activities; and design and deliver core training modules on operationalizing women's representation, leadership skills, decision-making in WUAs, and social audits tools. It will include capacity building activities on governance, O&M of irrigation services, systems building for accounting and record keeping, social accountability, and sustainable water sharing and utilization.
- (c) **Establishing internal and external links.** The component will, among other things, facilitate vertical integration of WUAs to function as collective; build capacity of WUAs on management and entrepreneurship through exposure visits, trade affairs, and structured training; provide targeted training and capacity building to strengthen management capabilities of women members in WUAs; and formalize links between WUAs and farmer producer organizations (FPOs).

#### **Component B: Minor irrigation services**

The component will improve access to water for irrigation, fisheries, and other livelihood activities through developing minor irrigation scheme clusters, including check dams (of less than 5 m in height in small streams), small-scale storage structures (ponds ranging from 400 to 4,000 m<sup>2</sup>), creek rehabilitation (up to 1.5 km), open dug wells, and tube wells; and scaling up water efficiency technologies, such as improved conveyance and application systems and irrigation scheduling informed by soil moisture measurements.

#### **Component C: Agricultural support services**

- (a) **Agricultural crops.** The component will invest in providing agricultural advisory services for field crops that are demand driven. The activities will include promoting efficient water management, high-yielding crop varieties, better agronomic practices, integrated soil fertility and nutrient management, integrated pest management and organic farming techniques, and other good agricultural practices.
- (b) **Horticulture.** The component will support farmers in participating in fruit, vegetable, and floriculture supply chains that are of higher value than field crops. It will include carrying out farmers' risk profiling, providing advisory services on good agricultural practices and innovative technologies, such as managing soil fertility and pests, formulating buyback arrangements and other contract farming in partnership with agribusiness companies, and



promoting precision farming. It will also support WUAs in procuring critical inputs such as hybrid seeds and planting materials and piloting post-harvest facilities for grading, packing, branding, storing, and transporting produce.

- (c) **Aquaculture.** The component will promote aquaculture through demonstrating and distributing modern technology practices, such as use of fish feed formulated with locally available ingredients, fingerling production and supply, cage fish culture, and culture-cum-capture models. It will also promote fish storage, transportation, and marketing. Inland fish production in tanks, ponds, and other inland water bodies can provide alternate livelihood to landless and marginal farmers.

#### Component D: Project management and technical support

- (a) **Project implementation and coordination.** The component will provide technical assistance, carry out training, acquire equipment, and finance incremental operating costs to strengthen the State Project Management Unit (SPMU) and District Project Management Units (DPMUs) to implement the Project, including modern facilities for advanced planning and execution.
- (b) **Organizational development.** The component will provide technical assistance to the Department of Water Resources Investigation and Development to institutionalize the best practices in implementation arrangements, processes, and design standards, including by establishing a cell for WUA development and support and a cell on planning and monitoring.

#### Legal Operational Policies

##### Triggered?

Projects on International Waterways OP 7.50	Yes
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Projects in Disputed Areas OP 7.60	No
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#### Summary of Assessment of Environmental and Social Risks and Impacts

The project does not envisage any major adverse impact on environment or on the community. Most activities proposed under the project, except those proposed under Component 2 are likely to be environmentally neutral or may have negligible environmental impacts. Since all sub-projects would be screened using exclusion criteria, sensitive ecological habitats, cultural properties etc., would not be impacted. The potential risk from the minor irrigation infrastructure developed under this project would result from noise, dust, wastewater, and waste generated from small-scale construction activities. These can cause some discomfort to the local communities but for a very short time as none of the construction activities is likely to be close to any settlement, and the average construction time is less than six months. All the above impacts can be mitigated with good construction practices. Occupational health impacts



from construction are not significant given the scale of construction, but some impacts can occur due to the improper handling and storage of pesticides. Pesticide consumption may increase due to the intensification of agriculture as water availability increases; however, the project would not procure any chemical pesticides but promote integrated nutrition management and Integrated pest management practice. The project, however, do not envisage any private land taking. Project during selection and finalization of sub project will conduct screening including Environment and safeguard (E&S) for early identification of E&S risks and impacts. The environment and social management framework (ESMF) includes negative list that will ensure that sub projects do not come in sensitive areas. Any adverse E&S impacts will be assessed and then managed in line with ESF requirements through the ESMF developed to guide ES assessment and ES management plan preparation for proposed activities under the project and some specific instruments like tribal development plan. Some of these measures will require DWRID to take the lead, while some others will require coordination with other stakeholders. For some other measures, the contractors to be hired for implementation would be required to implement the management measures. Apart from ESMF, project has also prepared Stakeholder Engagement Plan (SEP); Labor Management Procedure (LMP) and Environment and Social Commitment Plan (ESCP)

## **E. Implementation**

### Institutional and Implementation Arrangements

**The DWRID will be responsible for project management and coordination.** Within the DWRID, the existing SPMU and DPMUs created under Phase I will continue to implement the Project. The SPMU will continue to be headed by a Secretary in the GoWB, who will be the Project Director and will report to the State Level Technical Steering Committee. The DPMUs, 23 in total, will be led by Executive Engineers of the DWRID, reporting to the District Project Director at the rank of Superintending Engineer of the DWRID. Both the SPMU and DPMUs will be supported by multidisciplinary teams that consist of fiduciary, environmental and social (E&S), M&E, institutional development, agriculture, fisheries, farmer mobilization, GIS, and remote sensing specialists on a contract basis. To provide comprehensive support to beneficiaries, the Project will work with various departments including agriculture, agricultural marketing, food processing industries, horticulture, fisheries, and animal husbandry. The Project will emphasize training project staff to build long-term capacity and knowledge in the DWRID through collaboration with research and applied centers.

**Strategic support will be provided at the state level through the SLTSC.** Chaired by the Chief Secretary of the GoWB, or a high-ranking government official delegated by the Chief Secretary, the SLTSC will provide overall guidance and policy direction and ensure sound coordination between government entities involved. The SLTSC will meet at least once a year, or more frequently if needed, to take stock of project progress, approve annual work plans and budgets, and make course corrections if needed. Its members will include the Engineer in Chief and Ex-Officio Secretary of the DWRID and Secretaries of the Departments of Finance, Agriculture, Food Processing Industries, Horticulture, Fisheries, Agricultural Marketing, and Animal Husbandries.

**To facilitate and oversee the Project on the ground, DLICs will be formed.** The DLICs, chaired by the District Magistrate, will consist of nodal officers of the participating line departments in addition to representatives of



SOs and WUAs on an invitation basis. They will be responsible for coordination, approval of annual action plans, district-level oversight and progress monitoring, and, as needed, grievance redress and conflict resolution.

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## APPROVAL

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