



# Technical Assistance Report

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Project Number: 52153-002  
Transaction Technical Assistance (TRTA)  
June 2018

## India: Preparing for the Ara Canal Water Productivity Improvement Project

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Asian Development Bank

## CURRENCY EQUIVALENTS

as of 5 June 2018

Currency unit	–	Indian rupee (₹)
₹1.00	=	\$0.01491
\$1.00	=	₹67.0645

## ABBREVIATIONS

ADB	–	Asian Development Bank
BWRD	–	Bihar Water Resources Department
CCA	–	cultivable command area
ha	–	hectare
MOM	–	management, operation and maintenance
SCADA	–	supervisory control and acquisition data
TRTA	–	transaction technical assistance

## NOTE

In this report, “\$” refers to United States dollars.

<b>Vice-President</b>	Wencai Zhang, Operations 1
<b>Director General</b>	Hun Kim, South Asia Department (SARD)
<b>Director</b>	Mio Oka, Agriculture, Natural Resources and Environment, SARD
<b>Team leader</b>	Arnaud Cauchois, Principal Water Resources Specialist, SARD
<b>Team members</b>	Brando Angeles, Associate Environment Officer, SARD Cynthia Pancracia Geniza, Operations Assistant, SARD Rebekah Ramsay, Social Development Specialist, SARD Young Seo, Senior Counsel, Office of the General Rajesh Yadav, Senior Project Officer (Natural Resources and Agriculture), SARD

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## TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number:</b> 52153-002	
<b>Project Name</b>	Preparing for the Ara Canal Water Productivity Improvement Project	<b>Department/Division</b>	SARD/SAER
<b>Nature of Activity</b>	Project Preparation	<b>Executing Agency</b>	Bihar Water Resources Department
<b>Modality</b>	Regular		
<b>Country</b>	India		
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>	
✓ Agriculture, natural resources and rural development	Agricultural production		0.05
	Irrigation		0.95
		<b>Total</b>	<b>1.00</b>
<b>3. Strategic Agenda</b>	<b>Subcomponents</b>	<b>Climate Change Information</b>	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Medium
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>	
Governance and capacity development (GCD)	Institutional development	Some gender elements (SGE)	✓
Knowledge solutions (KNS)	Pilot-testing innovation and learning		
<b>5. Poverty and SDG Targeting</b>		<b>Location Impact</b>	
Geographic Targeting	No	Rural	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG2, SDG6, SDG7, SDG13		
<b>6. Risk Categorization</b>	Complex		
<b>7. Safeguard Categorization</b>	Safeguard Policy Statement does not apply		
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>1.000</b>	
Transaction technical assistance: Technical Assistance Special Fund		1.000	
<b>Cofinancing</b>		<b>0.000</b>	
None		0.000	
<b>Counterpart</b>		<b>0.545</b>	
Government		0.545	
<b>Total</b>		<b>1.545</b>	



## I. THE ENSUING PROJECT

1. The project is aligned with India's priority agenda to improve water use efficiency and water productivity in the irrigation sector to double farmers income and reduce the country water stresses. It also contributes to the implementation of Bihar agriculture road map 2017–2022. The project will support the modernization of the Ara canal system, 202,000 hectares (ha) cultivable command area, which comprises about 700 kilometers of unlined canals built in the 1870s. The modernization strategy of the Ara canal system follows the framework for modernization of major- and medium-sized irrigation that was elaborated for the Government of India under the Asian Development Bank's financed Scoping Study for a National Water Use Efficiency Improvement Support Program.<sup>1</sup>

2. The Ara canal system performance was assessed through the Food and Agriculture Organization rapid appraisal process. The results generally reflected a low level of water delivery services and a below-average overall performance. Due to deferred maintenance, the system is in poor physical condition. Damaged canals and control structures as well as outdated designs, equipment and procedures resulted in significant conveyance and distribution water losses. Weak management and operation by the Bihar Water Resources Department (BWRD) further hampers the overall performance of the system. There are large inequities in water distribution. Farmers located at the head of the canals waste plentiful amount of water. This reduces canal water availability for farmers located at the middle and tail of the canals. Therefore, most irrigation at the tail of the canal relies exclusively on costly groundwater pumping. The system average water use efficiency was estimated at 35% with irrigation water not reaching 50% of the command area.

3. The project will provide solutions to two key constraints of Ara main canal system performance: (i) inadequate irrigation infrastructure; and (ii) inadequate system management, and operation and maintenance (MOM). The project will also provide agriculture and marketing support services to help farmers maximize project benefits. The proposed project outcome will be: higher irrigation efficiency, agricultural water productivity and climate resilience in the Ara canal system. The proposed project outputs are: (i) Ara canal system irrigation infrastructure modernized; (ii) more efficient and sustainable management, operation and maintenance for the Ara canal system established; and (iii) farmers' capacity for on-farm water productivity improvement enhanced. The project will be aligned with the following impacts: (i) India farmers' income doubled by 2022;<sup>2</sup> (ii) Bihar State objective to have at least one food item in every Indian plate by 2022 achieved;<sup>3</sup> and (iii) resilience of farmers in the project area to ongoing and uncertain future climate change increased.<sup>4</sup>

4. Total investment cost is tentatively estimated at \$503 million including \$352 million to be financed from ADB's regular ordinary capital resources and \$151 million to be financed by the Government of Bihar. The transaction technical assistance (TRTA) and ensuing project are proposed for approval in 2018 and 2020, respectively, as listed in the country operations business plan, 2018–2020 for India.<sup>5</sup>

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<sup>1</sup> ADB. 2014. *Support for the Implementation of the National Water Mission by State Governments in India: Scoping Study for a National Water Use Efficiency Improvement Support Program*. Manila.

<sup>2</sup> Government of India, NITI Aayog. 2017. *Three Year Action Agenda (2017–2018 to 2019–2020)*. New Delhi.

<sup>3</sup> Government of Bihar. 2017. *Agriculture Road Map (2017–2022)*. Patna.

<sup>4</sup> Government of Bihar. 2015. *Bihar State Action Plan on Climate Change "Building Resilience through Development"*. Patna.

<sup>5</sup> ADB. 2017. *Country Operations Business Plan: India, 2018-2020*. Manila.

## II. THE TECHNICAL ASSISTANCE

### A. Justification

5. In December 2016, the Government of Bihar approached ADB for funding support. ADB noted that the modernization envisaged by BWRD was limited, with focus on improving conveyance efficiency through canal lining. In October 2017, BWRD recruited Tractebel Engineering Private Limited under a lump sum contract to prepare a modernization plan for the Ara canal system that would follow the framework for modernization of major- and medium-sized irrigation that was elaborated under the ADB-financed Scoping Study for a National Water Use Efficiency Improvement Support Program. The Tractebel Engineering Private Limited proposed project concept was reviewed by ADB reconnaissance mission and several technical and institutional improvements identified and agreed with BWRD. The project concept was therefore expanded to include a balance of engineering works including conjunctive use and pressure pipes for smaller flows, measures for improved MOM, and agriculture support.

6. The proposed TRTA is required to develop the project concept to feasibility study level and meet project readiness criteria for loan approval.<sup>6</sup> The TRTA will (i) develop feasibility design of the proposed project; (ii) review the technical and economic viability of the proposed project; (iii) evaluate safeguards requirements and prepare associated approval documents and implementation plans; (iv) prepare advance detailed design for 30% of the works, expected to be the main and branch canals prism re-sectioning and lining, as well as bidding documents for these works; (v) prepare design–build–operate (DBO) contracts for the management supervisory control and data acquisition system and also for the pressure-pipe systems; (vi) prepare consulting package(s) for detailed design, construction supervision and project implementation support; (vii) assist in preparation of loan documentation; and (viii) support implementation start-up.

### B. Outputs and Activities

7. The major outputs and activities are summarized in Table 1. The TRTA team is expected to be mobilized in July 2018.

**Table 1: Summary of Major Outputs and Activities**

Major Outputs	Delivery Dates	Key Activities with Milestones
1. Feasibility design, technical and economic feasibility and safeguards	December 2018	1.1 Expanded studies and groundwater modelling 1.2 Additional surveys including tube well pumping survey 1.3 Stakeholder consultations and Awareness 1.4 Additional engineering design including balancing storage, dedicated flow measurement structure, pressurized pumping systems, electric and solar energy, and SCADA 1.5 Institutions and MOM 1.6 Technical and economic feasibility 1.7 Safeguards assessment and plans
2. Detailed design for 30% of works with bidding documents, and DBO bidding documents for	2.1 August 2018 2.2 February 2019	2.1 Detailed design for main and branch canals prism re-sectioning and lining, and bidding documents 2.2 DBO bidding documents for SCADA system

<sup>6</sup> The TA will be posted in the business opportunities section of ADB's website in June 2018.



Major Outputs	Delivery Dates	Key Activities with Milestones
SCADA and 30% CCA equipped with pressurized pumping systems	2.3 February 2019	2.3 DBO bidding documents for pressurized pumping systems
3. Consulting packages terms of reference, loan documentation and implementation start up	3.1 September 2018 3.2 December 2018 3.3 December 2018	3.1 Consulting package(s) for detailed design of remaining works, construction supervision and project implementation support 3.2 Assist in preparation of loan documentation 3.3 Support implementation start-up

CCA = cultivable command area, DBO = design–build–operate, MOM = management, operation and maintenance, SCADA = supervisory control and acquisition data.

Source: Asian Development Bank.

### C. Cost and Financing

8. The TRTA is estimated to cost \$1,545,000 of which \$1,000,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-other sources). The government will finance and administer \$545,000 separate from ADB's fund flow. The government was informed that approval of the TA does not commit ADB to finance any ensuing project. The key expenditure items are listed in Appendix 1.

### D. Implementation Arrangements

9. ADB will administer the TRTA and will be responsible for selection, supervision and evaluation of consultants, and procurement of surveys financed by ADB under the TRTA.

10. The implementation arrangements are summarized in Table 2.

**Table 2: Implementation Arrangements**

Aspects	Arrangements		
Indicative implementation period	July 2018 to August 2019		
Executing agency	Asian Development Bank		
Implementing agencies	Bihar Water Resources Department		
Consultants	To be selected and engaged by ADB		
	Individual: individual selection	International, 31 person-months	\$809,000
Procurement	To be procured by consultants		
	Request for quotations	4 contracts	\$75,000
Disbursement	The TRTA resources financed by ADB will be disbursed following ADB's <i>Technical Assistance Disbursement Handbook</i> (2010, as amended from time to time).		
Asset turnover or disposal arrangement upon TA completion	Not Applicable		

ADB = Asian Development Bank, TRTA = transaction technical assistance.

Source: Asian Development Bank.

11. **Consulting services.** ADB will engage the consultants following the ADB Procurement Policy: Goods, Works, Nonconsulting and Consulting Services (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions.<sup>7</sup> The

<sup>7</sup> Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 2).

consultants will procure (i) remote sensing satellite surveys, (ii) land acquisition and resettlement census surveys and agro-socioeconomic surveys.

12. **Detailed engineering design.** The detailed engineering design for works at least 30% of the value of the ensuing loan will be exclusively financed by the Government of Bihar prior to project approval. The Government of Bihar has requested Tractebel Engineering Private Limited to undertake these tasks through a variation to the existing contract with increase in contract amount.

### III. THE PRESIDENT'S DECISION

13. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$1,000,000 on a grant basis to the Government of India for Preparing the Ara Canal Water Production Improvement Project, and hereby reports this action to the Board.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

Item	Amount in USD
<b>A. Asian Development Bank<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	680.0
b. Out-of-pocket expenditures	
i. International and local travel	80.0
ii. Goods (car rental)	30.0
iii. Reports and communications	5.0
iv. Miscellaneous administration and support costs <sup>b</sup>	14.0
2. Surveys	75.0
3. Training, seminars, and conferences	
a. Facilitators	3.0
b. Venue rental and related facilities	5.0
c. Participants	13.0
4. Contingencies	95.0
<b>Subtotal (A)</b>	<b>1,000.0</b>
<b>B. Government of Bihar</b>	
1. National consultants	466.5
2. Miscellaneous administration and support costs	19.0
3. Local travel	6.3
4. Vehicle and office equipment rental	31.7
5. Office space rental and related costs	21.5
<b>Subtotal (C)</b>	<b>545.0</b>
<b>Total</b>	<b>1,545.0</b>

Note: The transaction technical assistance (TRTA) is estimated to cost \$1,545 million, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of national consultants and associated logistic cost. The value of government contribution is estimated to account for 35.3% of the total TA cost.

<sup>a</sup> Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-other sources).

<sup>b</sup> Includes \$8,000 for support staff, \$3,000 for stationaries and other consumable, and \$3,000 for office equipment rental.

Source: Asian Development Bank estimates.

**LIST OF LINKED DOCUMENT**

<http://www.adb.org/Documents/LinkedDocs/?id=52153-002-TARreport>

1. Terms of Reference for Consultants