



# Technical Assistance Report

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Project Number: 46257-001  
Regional—Capacity Development Technical Assistance (R-CDTA)  
April 2016

## Strengthening Integrated Water Resources Management in Mountainous River Basins (Financed by the Japan Fund for Poverty Reduction)

This document is being disclosed to the public in accordance with ADB's Public Communications Policy 2011.

**Asian Development Bank**

## ABBREVIATIONS

ADB	–	Asian Development Bank
APWF	–	Asia-Pacific Water Forum
BWSI	–	Bhutan Water Security Index
CTL	–	country team leader
DSS	–	decision support system
GIS	–	geographic information system
HKH	–	Hindu–Kush Himalaya
HPCIDBC	–	High Powered Committee for the Integrated Development of the Bagmati Civilization
IWRM	–	integrated water resources management
MEW	–	Ministry of Energy and Water
NARBO	–	Network of Asian River Basin Organizations
NECS	–	National Environment Commission Secretariat
RBA	–	river basin agency
RBC	–	river basin committee
RBO	–	river basin organization
TA	–	technical assistance

## NOTE

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

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## CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number: 46257-001</b>	
<b>Project Name</b>	Strengthening Integrated Water Resources Management in Mountainous River Basins	<b>Department /Division</b>	SDCC/SDAS
<b>Country Borrower</b>	REG, AFG, BHU, NEP Regional	<b>Executing Agency</b>	ADB POHQ
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>Financing (\$ million)</b>	
✓ Agriculture, natural resources and rural development	Water-based natural resources management		2.00
		<b>Total</b>	<b>2.00</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	Low
Environmentally sustainable growth (ESG)	Disaster risk management Natural resources conservation		
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>	
Governance and capacity development (GCD)	Institutional development	No gender elements (NGE)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
Partnerships (PAR)	Implementation Regional organizations		
<b>5. Poverty Targeting</b>		<b>Location Impact</b>	
Project directly targets poverty	No	Not Applicable	
<b>6. TA Category:</b>	B		
<b>7. Safeguard Categorization</b>	Not Applicable		
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>0.00</b>	
None		0.00	
<b>Cofinancing</b>		<b>2.00</b>	
Japan Fund for Poverty Reduction		2.00	
<b>Counterpart</b>		<b>0.00</b>	
None		0.00	
<b>Total</b>		<b>2.00</b>	
<b>9. Effective Development Cooperation</b>			
Use of country procurement systems		No	
Use of country public financial management systems		No	

## I. INTRODUCTION

1. The proposed regional capacity development technical assistance (TA) will help strengthen integrated water resources management (IWRM) in Afghanistan, Bhutan, and Nepal.<sup>1</sup> The TA will contribute to the management of environment and climate change impacts, one of the strategic priorities in the Midterm Review of Strategy 2020 of the Asian Development Bank (ADB). It will do this by assisting target river basins in strengthening water resources management to cope with (i) expected changes in water availability due to climate change, and (ii) increase in water demand to support economic and population growth.<sup>2</sup> ADB's Water Operational Plan, 2011–2020 prioritizes embedding the IWRM process in river basins.<sup>3</sup> ADB had two consultation and fact-finding missions in Bhutan and one consultation and fact-finding mission each in Afghanistan and Nepal.<sup>4</sup> Governments' overall concurrence with the design and monitoring framework—including impact, outcome, outputs, implementation arrangements, cost estimate and financing plan, and terms of reference—were made during the fact-finding missions.

## II. ISSUES

2. Recent population growth, economic development, and urbanization are increasing water, food, and energy demand in Asia and the Pacific region. With more than 75% of the countries in the region lacking water security, the importance of water governance is increasing, and strengthening water resources management is becoming a pressing issue.<sup>5</sup> Climate change will affect temperature, rainfall, and cultivation patterns, which may add to the complexity and urgency of managing water resources. It will also increase the frequency and severity of water-related disasters.

3. The impact of climate change and competing demands for finite water resources require improved water resources management that considers all water users within a river basin. In Asia, the Hindu–Kush Himalaya (HKH) region is one of the areas that are most vulnerable and exposed to the impacts of climate change. As the source of major rivers—including Amu Darya, Ganges, Indus, Mekong, and Yangtze—the HKH area contains the world's third-largest freshwater reserve and provides water to almost 20% of the global population.<sup>6</sup>

4. IWRM could be a suitable tool to achieve good water governance. It can be responsive to stakeholders' needs, future water demands, and the likely impacts of climate change. Many countries in the region have already adopted national water policies that advocate IWRM in river basins.

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<sup>1</sup> The TA first appeared in the business opportunities section of the website of the Asian Development Bank (ADB) on 14 January 2016.

<sup>2</sup> ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

<sup>3</sup> ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

<sup>4</sup> In Afghanistan, a consultation mission was fielded in January 2015 and a fact-finding meeting in September 2015. In Bhutan, consultation missions were fielded in May 2013 and September 2014 and a fact-finding mission in August 2015. In Nepal, a consultation mission was fielded in December 2014 and a fact-finding mission in September 2015.

<sup>5</sup> ADB. 2013. *Asian Water Development Outlook 2013: Measuring Water Security in Asia and the Pacific*. Manila.

<sup>6</sup> With an area of 3.4 million square kilometers, the HKH region covers Afghanistan, Bangladesh, Bhutan, the People's Republic of China, India, Myanmar, Nepal, and Pakistan and has a population of about 1.5 billion. The world's first- and second-largest freshwater reserves are in the polar regions.

5. River basin organizations (RBOs) are crucial for IWRM implementation, which involves planning and monitoring water use, tracking regulatory changes with stakeholder involvement, and preparing investments. ADB projects in the HKH area have supported initiatives to establish RBOs.<sup>7</sup> Faced with basin water challenges, countries in the HKH area require immediate support for institutional strengthening and capacity building to strengthen the performance of existing RBOs in managing pressing water security challenges, and to form new RBOs, as appropriate.

6. The proposed TA will focus on HKH areas that rely on vulnerable water resources (glacial snow melt and precipitation). The target countries of the proposed TA (Afghanistan, Bhutan, and Nepal) were identified based on the following: (i) geographical location and vulnerability to climate change; (ii) needs of counterpart agencies in supporting river basin planning and institutional strengthening of RBOs; and (iii) strong linkage with ongoing or pipeline ADB projects supporting river basin management. Target river basins are Panj-Amu (Afghanistan), where a project preparatory TA for the Panj-Amu River Basin Project is undertaken; Wangchhu (Bhutan), where the proposed TA will supplement efforts undertaken by the Adapting to Climate Change through IWRM TA; and Bagmati (Nepal), where the proposed TA will be implemented in conjunction with the Bagmati River Basin Improvement Project.<sup>8</sup> The proposed TA is expected to benefit 8 million people in the three basins.

7. IWRM is a key element of ADB's Water for All policy.<sup>9</sup> The ADB Water Operational Plan, 2011–2020 (footnote 3) reinforces IWRM. At the 3rd World Water Forum, ADB signed a letter of intent with the Water Resources Development Public Corporation of Japan (now the Japan Water Agency) and the ADB Institute to launch the Network of Asian River Basin Organizations (NARBO).<sup>10</sup> NARBO has promoted the IWRM concept and has shared good practices of the IWRM approach in the Asia monsoon region for 10 years. ADB supported the establishment of an independent nonprofit network, the Asia-Pacific Water Forum (APWF), at the 4th World Water Forum.<sup>11</sup> Regional cooperation through APWF and NARBO could support IWRM investment programs and allow ADB to provide strategic assistance to its country programs.

8. From 2008 to 2014, ADB implemented a regional TA on managing water in Southeast Asia's river basins in collaboration with APWF and NARBO.<sup>12</sup> The proposed TA will build on the recommendations of the regional TA, including (i) further pilot implementation of a road map advisory service in other river basins; and (ii) RBO performance benchmarking can be expanded to more RBOs.<sup>13</sup> The proposed TA will adapt lessons from previous activities in Southeast Asia to South, Central and West Asia, where further IWRM efforts are needed.

<sup>7</sup> Since 2000, more than 30 ADB projects have supported IWRM in the HKH region and its downstream riparian countries.

<sup>8</sup> ADB. 2014. *Technical Assistance to the Kingdom of Bhutan for Adapting to Climate Change through Integrated Water Resources Management*. Manila; and ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Grant, and Administration of the Technical Assistance Grant to Nepal for the Bagmati River Basin Improvement Project*. Manila.

<sup>9</sup> ADB. 2003. *Water for All: The Water Policy of the Asian Development Bank*. Manila (adopted in 2001).

<sup>10</sup> The 3rd World Water Forum was held in Kyoto in March 2003. Since its establishment in 2004, NARBO has expanded to embrace 85 member organizations from 18 countries.

<sup>11</sup> The 4th World Water Forum is held in Mexico City in 2006. APWF was officially launched on 27 September 2006 at the ADB headquarters. A number of key institutions from the region have committed to support APWF as "lead organizations" responsible for achieving progress under each priority theme and key result area.

<sup>12</sup> ADB. 2008. *Technical Assistance for Managing Water in Asia's River Basins: Charting Progress and Facilitating Investment*. Manila.

<sup>13</sup> ADB. 2015. *Technical Assistance Completion Report: Managing Water in Asia's River Basins: Charting Progress and Facilitating Investment*. Manila.

9. The TA will contribute to IWRM implementation in selected river basins through strengthening of RBOs and capacity building of relevant staff.

### III. THE PROPOSED CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

#### A. Impacts and Outcome

10. The impacts will be: (i) by 2020, accelerated and expanded implementation of IWRM, delivering improved water security and enhanced efficiency and productivity (footnote 3); and (ii) by 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate.<sup>14</sup> The outcome will be IWRM in target river basins sustainably implemented. The design and monitoring framework is in Appendix 1.

#### B. Methodology and Key Activities

11. The outputs of the TA in target river basins will include (i) water resources institutions strengthened; (ii) technical capacity of staff of water resources institutions in target river basins enhanced; and (iii) knowledge of and good practices for IWRM broadly disseminated in Asia and the Pacific region.

12. Output 1 will undertake activities for institutional strengthening of target RBOs and their relevant agencies for improved IWRM for ADB projects, which are or will be implemented in the same river basins. Joining a regional network of RBOs will provide sustainable benefits to governments and RBOs by providing external resources, such as technical advice and access to knowledge hubs. This will contribute to skills strengthening and experience acquiring for governments and RBOs.

13. In Afghanistan, activities will include (i) introducing and customizing an institutional framework for RBO performance benchmarking to the Panj-Amu River Basin Agency (RBA) as its performance monitoring procedure;<sup>15</sup> and (ii) supporting the Ministry of Energy and Water (MEW) and the RBA to undertake their institutional mandates, such as the establishment of an advisory board and river basin council at the RBA, and pilot implementation of a national irrigation program.

14. In Bhutan, activities will include (i) supporting the National Environment Commission Secretariat (NECS) and the Wangchhu River Basin Committee (RBC) and its secretariat with the implementation of the river basin management plan developed under the preceding TA to Bhutan (footnote 8); (ii) facilitating the formation and registration of water users associations within the Wangchhu river basin; (iii) supporting the NECS and the RBC and its secretariat to institutionalize the Bhutan Water Security Index within the government's 5-year planning cycle; (iv) expanding the database developed under the preceding TA (footnote 8) to maintain water resources data and information of water users associations in the Wangchhu river basin; and (v)

<sup>14</sup> United Nations. Goal 6: Ensure access to water and sanitation for all.  
<http://www.un.org/sustainabledevelopment/water-and-sanitation/>

<sup>15</sup> RBO performance benchmarking was developed in ADB. 2006. *Technical Assistance for Process Development for Preparing and Implementing Integrated Water Resources Management Plans*. Manila; and ADB. 2008. *Technical Assistance for Managing Water in Asia's River Basins: Charting Progress and Facilitating Investment*. Manila. The proposed TA seeks to extend the application of RBO performance benchmarking to newly established RBOs. Performance benchmarking is a collection of reliable and useful practical indicators from various aspects to measure RBO performance. By undertaking periodic updates, the indicators will help RBOs monitor their performance in a sustainable manner to observe improvement and highlight weaknesses.

introducing and customizing an institutional framework for RBO performance benchmarking to the Wangchhu RBC.

15. In Nepal, activities will include (i) providing an external advisory service team consisting of experts from regional knowledge hubs and/or RBO practitioners to support the Water and Energy Commission Secretariat, the High Powered Committee for the Integrated Development of the Bagmati Civilization (HPCIDBC), and the Bagmati RBO with the preparation of a river basin master plan; and (ii) introducing and customizing an institutional framework for performance benchmarking of the Bagmati RBO.

16. Output 2 will provide individual technical capacity building training to relevant agencies to accelerate IWRM implementation.

17. In Afghanistan, activities will include (i) IWRM training for at least 30 government officers through capacity building programs, including geographic information systems mapping, and water resources data management and allocation; and (ii) preparing an RBO human resources capacity development action plan consistent with the national capacity development policy and strategy for the water sector.

18. In Bhutan, activities will include (i) training for at least 30 government officers and stakeholders in the implementation of IWRM and geographic information systems mapping; and (ii) supporting the Wangchhu RBC and its secretariat to prepare and implement its human resources capacity development plan.

19. In Nepal, activities will include (i) delivering IWRM training for at least 30 water engineers, government officers, and stakeholders. This will include building their capacity to sustainably operate and maintain a decision support system developed under the Bagmati River Basin Improvement Project; (ii) improving water monitoring facilities for the decision support system; and (iii) preparing the RBO human resources capacity development plan to maintain the capacity of the RBO and its operational staff to keep the required standard despite frequent human resources rotation. The target government agencies for the capacity building program include HPCIDBC, Water and Energy Commission Secretariat, Ministry of Irrigation, Department of Irrigation, Department of Hydrology and Meteorology, and Bagmati RBO.

20. Output 3 will prepare knowledge products based on TA outcomes and lessons, and will be disseminated to target and developing member countries through regional workshops and conferences. One knowledge product will focus on the formulation of an RBO and consensus-making mechanism in mountainous river basins that are vulnerable to climate change and have diverse stakeholders. The other knowledge product will focus on river basin planning that integrates climate change adaptation and disaster risk management.

### **C. Cost and Financing**

21. The proposed TA is estimated to cost \$2 million, which will be financed on a grant basis by the Japan Fund for Poverty Reduction and administered by ADB. The cost estimates are in Appendix 2.

### **D. Implementation Arrangements**

22. ADB will execute the TA through the Water Sector Group Secretariat in the Sustainable Development and Climate Change Department in collaboration with the Central and West Asia



and South Asia departments. The implementing agencies are the MEW in Afghanistan, the Water Resources Coordination Division of NECS in Bhutan, and the HPCIDBC in Nepal.

23. Implementation of the TA in the selected basins will involve staff from the concerned water agencies, other government agencies and stakeholders. During TA implementation, mobilization of senior IWRM experts or RBO practitioners through regional networks such as NARBO and/or APWF will be considered as resources persons for knowledge sharing.

24. The TA will be implemented from May 2016 to April 2019. An outline of the terms of reference for consultants is in Appendix 3. ADB will engage international and national consultants through a consulting firm, following the quality- and cost-based selection method with a quality-to-cost ratio of 90:10. ADB will select and engage the consulting firm in accordance with the Guidelines on the Use of Consultants (2013, as amended from time to time). An output-based contract will be used for consulting services. Six international consultants will provide 32 person-months of service and seven national consultants will render 127 person-months. All disbursements under the TA will be made in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

25. The TA consultants will submit (i) an inception report at the end of the third month following mobilization; (ii) quarterly progress reports; (iii) an interim report at the end of the 18th month; (iv) a draft final report at the end of the 34th month; and (v) a final report that incorporates comments by ADB, concerned RBOs, and other stakeholders. Meetings between ADB and the consultants, and other concerned parties, will be held following report submission and as often as necessary. The TA's outputs will be posted on ADB's website.

26. In each target country, the implementing agency will provide counterpart support in the form of (i) documents, data, statistics, information, or maps; (ii) counterpart staff; (iii) assistance for coordination with stakeholders and organizations; (iv) logistic assistance for workshops and seminars, including sending invitations to participants; and (v) other in-kind contributions.

27. The MEW in Afghanistan and HPCIDBC in Nepal will provide further counterpart support in the form of (i) office space for consultants; and (ii) quality control of consultants' outputs, including supervision of consultants' working hours.

#### **IV. THE PRESIDENT'S DECISION**

28. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$2,000,000 to be financed on a grant basis by the Japan Fund for Poverty Reduction for Strengthening Integrated Water Resources Management in Mountainous River Basins, and hereby reports this action to the Board.

## DESIGN AND MONITORING FRAMEWORK

<b>Impacts the TA is Aligned With</b>			
<p>By 2020, accelerated and expanded implementation of IWRM, delivering improved water security and enhanced efficiency and productivity (Water Operational Plan 2011–2020)<sup>a</sup></p> <p>By 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate (Sustainable Development Goal 6.5)<sup>b</sup></p>			
<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting</b>	<b>Risks</b>
<p><b>Outcome</b> IWRM in target river basins sustainably implemented<sup>c</sup></p>	<p>All target RBOs provide baseline scores of RBO performance benchmarking<sup>d</sup> in practice by Q1 2019 (Baseline: 0)</p>	<p>NARBO annual report</p>	<p>Insufficient financing, policy changes, or lack of interest in IWRM investments from target developing member countries</p>
<p><b>Outputs</b> 1. Water resources institutions strengthened<sup>e</sup></p> <p>2. Technical capacity of staff of water resources institutions in target river basins enhanced</p> <p>3. Knowledge of and good practices for</p>	<p>1a. Wangchhu RBO maintains water security database by Q1 2019 (Baseline: 0)</p> <p>1b. 15-year river basin master plan prepared in Bagmati river basin in Nepal by Q4 2018 (Baseline: 0)</p> <p>1c. Performance benchmarking is institutionalized in all target river basins by Q4 2018 (Baseline: Target agencies are established)</p> <p>2a. One DSS operated and maintained in practice in the Bagmati river basin by Q1 2019 (Baseline: 0)</p> <p>2b. At least 30 government officers and stakeholders in each target river basin trained in IWRM by Q4 2018 (Baseline: 0)</p> <p>2c. Capacity development plan for IWRM developed for all target river basins by Q4 2018 (Baseline: 0)</p> <p>3a. Two major knowledge products on IWRM good</p>	<p>1a. Annual performance agreement review report by Government of Bhutan June 2019</p> <p>1b. 15-year river basin master plan by Bagmati RBO</p> <p>1c. NARBO annual report</p> <p>2a. Progress reports of the Bagmati River Basin Improvement Project</p> <p>2b. NARBO annual report</p> <p>2c. Capacity development plan of Wangchhu RBO, Panj-Amu RBA, and Bagmati RBO</p> <p>3a. ADB's website</p>	<p>Lack of commitment and/or available staff in RBOs to participate in the proposed activities; deterioration of security situation in the Panj-Amu river basin</p>

<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting</b>	<b>Risks</b>
IWRM broadly disseminated in Asia and the Pacific region	practices uploaded to ADB's website by Q4 2018 (Baseline: 0) <sup>f</sup>  3b. At least one resource person from each RBO contributed to regional water event by Q4 2018 (Baseline: 0)	3b. Event proceedings	

### **Key Activities with Milestones**

#### **1. Water resources institutions strengthened**

- 1.1 Mobilization of advisory service team for Bagmati RBO by Q1 2017
- 1.2 Customize RBO performance benchmarking indicators in all target RBOs by Q3 2017
- 1.3 Propose draft framework for RBO performance benchmarking in all target RBOs by Q1 2018
- 1.4 Finalize RBO performance benchmarking frameworks by Q3 2018
- 1.5 Facilitate formation and registration of water users associations in the Wangchhu river basin by Q1 2018
- 1.6 Report Wangchhu BWSI 2018 in Bhutan by Q1 2019
- 1.7 Hold quarterly RBC meetings by Q1 2019

#### **2. Technical capacity of staff of water resources institutions in target river basins enhanced**

- 2.1 Report water flow and water quality of the Wangchhu river basin by Q4 2018
- 2.2 Organize technical capacity development programs for all target RBOs by Q3 2018
- 2.3 Organize capacity development programs for ministry staff in Afghanistan by Q3 2018
- 2.4 Ensure DSS is functioning at the Bagmati river basin in Nepal by Q3 2018
- 2.5 Finalize IWRM capacity development plan in all target RBOs by Q3 2018
- 2.6 Report water flow data in Nepal by Q1 2019

#### **3. Knowledge of and good practices for IWRM broadly disseminated in Asia and the Pacific region**

- 3.1 Initiate knowledge products on IWRM good practices by Q1 2018
- 3.2 Identify a regional water event to support or participate in by Q1 2018

### **Inputs**

Japan Fund for Poverty Reduction: \$2 million (grant)

The target governments will provide counterpart support in the form of counterpart staff and other in-kind contributions.

### **Assumptions for Partner Financing**

Not applicable.

ADB = Asian Development Bank, BWSI = Bhutan Water Security Index, DSS = decision support system, IWRM = integrated water resources management, NARBO = Network of Asian River Basin Organizations, Q = quarter, RBA = river basin agency, RBC = river basin committee, RBO = river basin organization.

<sup>a</sup> ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

<sup>b</sup> United Nations. Goal 6: Ensure access to water and sanitation for all.  
<http://www.un.org/sustainabledevelopment/water-and-sanitation/>

<sup>c</sup> The target river basins are Panj-Amu river basin in Afghanistan, Wangchhu river basin in Bhutan, and Bagmati river basin in Nepal.

<sup>d</sup> RBO Performance benchmarking is a collection of indicators that evaluates RBO performance in various aspects such as mission, stakeholders, learning and growth, internal business processes and finance. TA will help RBOs to institutionalize the periodic evaluation process of RBO performance benchmarking to observe improvement and highlight weaknesses.

<sup>e</sup> Water resources institutions can be called RBA, RBC, or RBO according to the legal background in each target country.

<sup>f</sup> One knowledge product will focus on the formulation of RBO and the other on river basin planning.

Source: Asian Development Bank.

**COST ESTIMATES AND FINANCING PLAN**

(\$'000)

<b>Item</b>	<b>Amount</b>
<b>Japan Fund for Poverty Reduction<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	654.0
ii. National consultants	517.0
b. International and local travel	246.0
c. Reports and communications	10.0
2. Surveys <sup>b</sup>	100.0
3. Training, seminars, and conferences <sup>c</sup>	237.0
4. Miscellaneous administration and support costs <sup>d</sup>	42.0
5. Contingencies	194.0
<b>Total</b>	<b>2,000.0</b>

RBC = river basin committee, RBO = river basin organization.

<sup>a</sup> Administered by the Asian Development Bank.

<sup>b</sup> Surveys for water flow and water qualities of target river basins.

<sup>c</sup> The cost includes inception and completion workshops, nine RBC regular meetings in Bhutan, two stakeholder workshops for a road map advisory service in Nepal, six workshops for RBO performance benchmarking (two workshops for each target country), three capacity development training courses (one training course for each target country), one decision support system training in Nepal, two knowledge products, one regional event, and two study tours to Japan. It also includes travel costs for ADB staff as resource persons and costs of dissemination activities. In Bhutan, one capacity development training course and two workshops for RBO performance benchmarking will be packaged with RBC regular meetings in addition to nine regular RBC meetings. In total 12 RBC meetings will be supported.

<sup>d</sup> The cost includes office rent, local support staff, photocopying, stationery supplies, utilities, and cleaning expenses. Salaries of local support staff should be within local market rates or \$900 per month, whichever is lower.

Source: Asian Development Bank estimates.

## OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

### A. Introduction

1. The technical assistance (TA) will be carried out over 36 months. The Asian Development Bank (ADB) will engage 32 person-months of international and 127 person-months of national consulting services through a single consulting firm. Of these, 12 person-months of international and 47 person-months of national consulting services will be provided for Afghanistan, 7 person-months of international and 68 person-months of national consulting services will be provided for Bhutan, and 13 person-months of international and 12 person-months of national consulting services will be provided for Nepal.

2. The consultants will work as a team under the leadership of the international senior integrated water resources management (IWRM) specialist. ADB will recruit and undertake direct engagement of a consultant firm in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

### B. Terms of Reference for Team Members

3. **Team leader and senior integrated water resources management specialist** (international, 17 person-months, intermittent). The team leader preferably has a master's degree in water resources management or a related field and 15 years of experience in implementing IWRM, formulating policy, developing institutions, and developing capacity, preferably within Asia. Experience with multilateral institutions in project identification, implementation, and evaluation will be considered positively. Working experience as river basin managers or practitioners in Asia will be highly valuable.

4. The team leader will (i) lead a team of international and national consultants and ensure team integration through coordination and regular meetings with team members, ADB, government, river basin organizations (RBOs), and other stakeholders; (ii) manage the relations and liaise with the external experts and various organizations in the region; (iii) supervise the team members' activities and take overall responsibility for the quality, consistency, and timely delivery of all TA products in accordance with ADB's policies and standards; (iv) manage the financial and technical aspects of TA operations; (v) have overall responsibility for the conduct of TA activities, such as TA inception and completion workshops, basin stakeholder workshops, training courses, dialogues, international meetings, mobilization of a road map advisory service for river basin planning in Nepal, delivery of capacity development programs to target institutions, preparation of draft human resources capacity development plan, customization and institutionalization of RBO performance benchmarking, and preparation of knowledge products; (vi) supervise institutional strengthening and capacity development activities in a cross-cutting way; (vii) be responsible for water resources surveys in the target river basins; and (viii) carry out the technical responsibilities for all TA components. The team leader will deliver expertise in IWRM and disaster risk management. The team leader will lead development of knowledge products based on the outputs of the TA.

5. **Country team leader** (national, 29 person-months, Afghanistan). The country team leader (CTL) preferably has 15 years of experience in institutional strengthening, capacity development, and communications in water resources projects. Regional experience is preferred. Preferably, the CTL has a master's degree or its equivalent in water resources management, institutional strengthening, or financial management. Working experience in

designing and implementing training programs related to water resources management and modeling will be considered positively.

6. The CTL will monitor and coordinate the implementation of TA activities with ADB's water sector group and TA implementation partners. The CTL will assist the team leader in communicating with counterparts in Afghanistan. The CTL will support the target river basin agency (RBA) and subriver basin agencies to strengthen their institutional capacities. The CTL will take overall responsibility for tailoring capacity building programs and institutionalizing the RBO performance benchmarking procedure in consultation with counterpart agencies. In coordination with team members and counterpart agencies, the CTL will formulate tailored capacity building programs based on training needs assessment. The training will include water resources data management and allocation, which will be the foundation of annual planning and budget application to the Ministry of Finance. The CTL will customize and develop a procedure to evaluate RBO performance benchmarking, and assist the Panj-Amu RBA to demonstrate RBO performance benchmarking. Under the guidance of the human resources capacity development policy and strategy in the water sector, the CTL will develop an action plan to ensure the level of performance of the RBO. The CTL will support the Panj-Amu RBA and the Ministry of Energy and Water to undertake their institutional mandates, which may include (i) implementation of a national irrigation program developed under the Ministry of Agriculture, Irrigation and Livestock; (ii) the establishment of RBA's advisory board and river basin council; and (iii) the development of a comprehensive river basin master plan in the target river basin. The CTL will identify the challenges of Water Law implementation as necessary. The CTL will support the team leader in preparing knowledge products and outputs.

7. **Country team leader** (national, 33 person-months, Bhutan). The CTL preferably has 15 years of experience in institutional strengthening, capacity development, and communications in water resources projects. Regional experience is preferred. The CTL preferably has a master's degree or its equivalent in water resources management, institutional strengthening, or financial management. Working experience in designing and implementing training programs related to water resources management and modeling will be considered positively.

8. The CTL will monitor and coordinate the implementation of TA activities with ADB's water sector group and TA implementation partners. The CTL will assist the team leader in communicating with counterparts in Bhutan. The CTL will work closely with the National Environment Commission Secretariat (NECS) to help the target RBO strengthen its institutional capacities. The CTL will support NECS in the operationalization of the Wangchhu River Basin Committee (RBC), including supporting the work of the RBC secretariat. The mandate will include coordination with stakeholders; facilitation of regular meetings, and the formation and registration of water users associations; and implementation of other mandates as Wangchhu RBC secretariat. The CTL will take overall responsibility for tailoring capacity building programs and institutionalizing the RBO performance benchmarking procedure in consultation with counterpart agencies. The CTL will customize performance benchmarking for RBC and its secretariat, develop a procedure to evaluate RBO performance benchmarking, and assist the Wangchhu RBC to demonstrate RBO performance benchmarking. The CTL will develop a human resources capacity development plan to ensure the level of performance of the RBC. After project completion, the CTL will compile recommendations for the RBC's sustainable operational arrangement, taking financial, human resources, responsibility, authority, and other relevant aspects into consideration. The CTL will support the team leader in preparing knowledge products and outputs.

9. **Country team leader** (national, 12 person-months, Nepal). The CTL preferably has 10 years of experience in institutional strengthening, capacity development, and communications in water resources projects. Regional experience is preferred. The CTL preferably has a master's degree or its equivalent in water resources management, institutional strengthening, or financial management. Working experience in designing and implementing training programs related to water resources management and modeling will be considered positively.

10. The CTL will monitor and coordinate the implementation of TA activities with ADB's water sector group and TA implementation partners. The CTL will assist the team leader in communicating with counterparts in Nepal. The CTL will help target RBOs to strengthen their institutional capacities. The CTL will take overall responsibility for tailoring capacity building programs and institutionalizing the RBO performance benchmarking procedure in consultation with counterpart agencies. The CTL will work closely with the Bagmati River Basin Improvement Project team and the team leader of its attached TA project. In addition to the team leader, the CTL will report to the project director. In close communication with team members and counterpart agencies, the CTL will formulate tailored capacity building programs based on the training needs assessment. The CTL will customize RBO performance benchmarking, develop a procedure to evaluate RBO performance benchmarking, and assist the Bagmati RBO to demonstrate RBO performance benchmarking. The CTL will develop a human resources capacity development plan to ensure the level of performance of the RBO. The CTL will support the team leader in preparing knowledge products and outputs.

11. **Water security specialist** (national, 22 person-months, Bhutan). The specialist preferably has a master's degree in civil engineering, water resources management, or a related field, and 10 years of experience in Asia. The specialist preferably has successful experience in assessment of water security in Asia.

12. Under the guidance of the team leader and technical support from the national geographic information system (GIS) specialist and hydro modeler, the water security specialist will assist NECS in institutionalizing and refining the Bhutan Water Security Index (BWSI) framework. The specialist will lead the evaluation of the Wangchhu river basin's BWSI based on the framework. The specialist will assist NECS in institutionalizing the BWSI evaluation process in Wangchhu RBC operations by supporting the Wangchhu RBC and its secretariat to collect and update outstanding BWSI information, and establish the framework for routine updating of all data to fit the government's 5-year planning cycle. The specialist will evaluate each of the five key BWSI dimensions of the river basins based on the collected and updated data.

13. **Hydro modeler** (national, 6 person-months, Bhutan). The consultant preferably has a master's degree or its equivalent in hydrology, atmospheric science, water resources management, or a closely related discipline with preferably 10 years of experience in climate science and modeling, hydrologic and water resources modeling, and hydroclimatic field instrumentation. The national consultant preferably has 10 years of experience in planning, developing, implementing, and using hydrologic, hydraulic, and river basin models and decision support system (DSS). Successful experiences in establishing an IWRM DSS in a developing country will be considered positively. Regional and project preparatory experience is preferred.

14. Under the guidance of the team leader, the consultant will lead river basin modeling activities to support BWSI evaluation of the Wangchhu river basin. The consultant will build on and update the modeling work undertaken by the Adapting to Climate Change through

Integrated Water Resources Management TA<sup>1</sup> and provide updated basin level information (domestic water supply, irrigation, hydropower generation, and environmental flow requirements in the face of climate change, among other types of information) and technical inputs (i) to the national GIS specialist for the DSS of the RBC, (ii) for the capacity building activities to help RBC staff understand river basin modeling, and (iii) to the draft human resources capacity development plan. The consultant will support the team leader and the CTL in preparing reports.

15. **Geographic information systems, remote sensing, and database specialist** (international, 4 person-months). The specialist preferably has 10 years of experience in planning, developing, implementing, and using GIS, remote sensing, and database systems. Regional experience will be considered positively. A master's degree or its equivalent in GIS, databases, or information systems is considered positively.

16. The specialist will support and take overall responsibility over the technical aspect of GIS, remote sensing, and database system. The specialist will be in charge of customizing and reviewing data sharing indicators in RBO performance benchmarking. The specialist will support the team leader and CTL in preparing outputs. In Bhutan, the specialist will also deliver capacity development programs for basin practitioners, which would allow them to update the GIS database in coordination with the CTL. In Nepal, the specialist will assist the CTL in designing and delivering the capacity development training course and human resources capacity development plan.

17. **Geographic information systems and information technology specialist** (national, 7 person-months, Bhutan). The specialist preferably has 10 years of experience in planning, developing, implementing, and using GIS and information technology system development. Regional experience will be considered positively.

18. The specialist will support the water security specialist by developing a comprehensive water resources database for the Wangchhu river basin, which will provide the basis for BWSI evaluation. The database developed under the preceding TA (footnote 1) will be expanded to maintain a comprehensive water resources data and an inventory of water users associations in the Wangchhu river basin. The specialist will develop a DSS that builds on the water resources database for the Wangchhu river basin. The specialist will compile an operational manual for all database systems developed under the proposed TA and deliver capacity development training for NECS staff before its handover. The specialist will support the team leader and CTL in preparing outputs.

19. **Geographic information systems and information technology specialist** (national, 18 person-months, Afghanistan). The specialist preferably has 10 years of experience in planning, developing, implementing, and using GIS and information technology system development. Regional experience will be considered positively.

20. The specialist will support capacity development in (i) water resources planning tools, (ii) water resources data management, (iii) water allocations and water resources planning, (iv) GIS, (v) global positioning system, and (vi) operation and maintenance of the GIS database in the RBA. Based on the RBA's request, the specialist will also work on integrating the canal system and crop recording databases.

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<sup>1</sup> ADB. 2014. *Technical Assistance to the Kingdom of Bhutan for Adapting to Climate Change through Integrated Water Resources Management*. Manila.



21. **Decision support system specialist** (international, 4 person-months, Nepal). The specialist preferably has a master's degree in civil engineering or a related field and 10 years of experience in Asia. The specialist has proven experience in development transfer and maintenance of DSS.

22. The specialist will support DSS development and capacity building. The specialist will take overall responsibility over DSS-related outputs and will strengthen the sustainability of DSS operations by devising a strategy, preparing an operation and maintenance manual, and delivering operation training to and building the capacity of staff in the Water and Energy Commission Secretariat, High Powered Committee for the Integrated Development of the Bagmati Civilization, Bagmati RBO, and relevant organizations. The specialist will support the DSS development process and provide sustainable design advice, and review the proposed numerical models and approach used in the DSS. The specialist will support the team leader and CTL in preparing outputs.

23. **Financial specialist** (international, 2 person-months). The financial specialist preferably has 15 years of work experience in project financial analysis. Regional experience will be considered positively. A degree in accounting, finance, business or a related field and a professional certification (certified public accountant, chartered accountant, chartered financial analyst) will be considered positively.

24. The specialist will be in charge of customizing and reviewing two RBO performance benchmarking indicators: cost recovery and financial efficiency. The specialist will support the team leader in the preparation and timely delivery of outputs.

25. **Environment specialist** (international, 3 person-months). The specialist will preferably have a master's degree or higher in environmental studies and 7 years of working experience in environmental assessment. Regional experience will be considered positively.

26. The specialist will assist the CTLs in designing and delivering the capacity development training course and human resources capacity development plan. The specialist will be in charge of the environmental audit of the RBO performance benchmarking. The specialist will support and provide specific inputs to other specialists as needed.

27. **Social development specialist** (international, 2 person-months). The specialist will preferably have a master's degree or its equivalent in social sciences and/or development studies, and 7 years of work experience in social development and safeguard planning and implementation. Regional experience will be considered positively.

28. The specialist will be in charge of the basin livelihood indicator for the RBO performance benchmarking. The specialist will include social, socioeconomic, and gender aspects into the indicator as appropriate. The specialist will support and provide specific inputs to other specialists as needed.