Technical Assistance Report

Project Number: 48060-001
Policy and Advisory Technical Assistance (PATA)
December 2014

Mongolia: Country Water Security Assessment

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 15 November 2014)

Currency unit	–	togrog (MNT)
MNT1.00	=	$0.00053
$1.00	=	MNT1,875.00

ABBREVIATIONS

ADB	–	Asian Development Bank
CWSA	–	country water security assessment
IWRM	–	integrated water resources management
MEGD	–	Ministry of Environment and Green Development
TA	–	technical assistance

NOTE

In this report, "$" refers to US dollars.

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POLICY AND ADVISORY TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 48060-001

Project Name	Country Water Security Assessment	**Department /Division**	EARD/EAER
Country	Mongolia	**Executing Agency**	Ministry of Environment and Green Development
Borrower	Not Applicable		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ Agriculture, natural resources and rural development	Land-based natural resources management	0.10
	Rural water policy, institutional and capacity development	0.10
	Water-based natural resources management	0.10
Water and other urban infrastructure and services	Urban sanitation	0.10
	Urban water supply	0.10
	Total	**0.50**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Medium
Environmentally sustainable growth (ESG)	Natural resources conservation Urban environmental improvement		

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development Institutional systems and political economy	No gender elements (NGE)	✓

5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Nation-wide	High

6. TA Category: B

7. Safeguard Categorization Not Applicable

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**0.50**
Sovereign Policy and advisory technical assistance: Technical Assistance Special Fund	0.50
Cofinancing	**0.00**
None	0.00
Counterpart	**0.00**
None	0.00
Total	**0.50**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	Yes

I. INTRODUCTION

1. During the country programming mission for Mongolia on 17–20 February 2014, the government requested the Asian Development Bank (ADB) to provide policy and advisory technical assistance (TA) in conducting a national country water security assessment (CWSA). The TA was included in ADB's country operations business plan, 2014–2016.[1] ADB and the Government of Mongolia agreed on the TA's scope, impact, outcome, outputs, implementation arrangements, financing and cost estimates, and terms of reference. Multi-stakeholder discussions were held during a consultation mission from 13 to 15 August 2014. The design and monitoring framework is in Appendix 1.[2]

II. ISSUES

2. Mongolia has an extreme cool continental climate with long, cold winters. Most of the precipitation falls during the short summers. Spatial variability in rainfall is large.[3] Mongolia's annual renewable surface water resources are plentiful, but are scattered over large areas, mainly in the northern part of the country. Most water resources are not readily accessible for major population centers, mining operations, and other industrial operations. As a result, Mongolia has many localized water stress situations. For example, there is high dependence on groundwater in the South Gobi; an increasing dependence on recharged groundwater for Ulaanbaatar's water supply with potential problems during winter and spring months; and it is difficult and costly to transport resources across the vast country. These potentially large in-region and in-basin deficits constrain Mongolia's economic and social development.[4]

3. Development in Mongolia has also been greatly influenced by the country's rapid rate of urbanization. By the end of 2008, about 1.66 million people (roughly 60% of the total population) were living in urban areas in Mongolia. Increased demand by residential and commercial consumers for urban services (water supply and sanitation) has outstripped supply, particularly in Ulaanbaatar and in *aimag* (province) centers. Mongolia's fastest-growing urban area is Ulaanbaatar. The continued growth of Ulaanbaatar in conjunction with increasing urban consumption is projected to lead to water shortages as early as 2015. In addition, Ulaanbaatar's water security is challenged by three factors. Industrial pollution is high, particularly due to discharges with high pollution levels (e.g., tanneries). Wastewater treatment is ineffective, with no recycling of wastewater. Finally, seasonal variation in Tuul River's water level results in lower groundwater levels in spring. The threat to water security has become a constraint on economic growth.

4. Mongolia is already seeing the impacts of climate change. Natural disasters such as drought, heavy snowfall, flood, and wind storms, and extreme cold and hot temperatures are becoming more and more frequent. The future under a climate change scenario is uncertain, but climate models predict a decrease in river water levels, higher seasonal variations, and a decrease in groundwater levels due to reduced recharge.

5. Government policies are placing emphasis on the mining sector as a key driver of national economic development. Extensive water-intensive mining activities are inducing

[1] ADB. 2014. *Country Operations Business Plan: Mongolia, 2014–2016*. Manila.
[2] The TA first appeared in the business opportunities section of ADB's website on 9 October 2014.
[3] The annual average precipitation amount is around 200 to 220 millimeters, ranging from 38.4 millimeters in some parts of the Gobi desert region to about 400 millimeters in some areas in the north.
[4] Ulaanbaatar obtains around 98% of its water from groundwater.

regional restructuring of economic development and consequently influencing demographics throughout Mongolia, increasing environmental vulnerability, and heightening water security (both quality and quantity) risks. Mongolia's future development rests heavily on its water–energy–food nexus. Moving toward energy security and food security will require a considerable amount of its scarce water resources. Increasing urbanization and population growth, natural disaster risks, and energy and agricultural development projects may lead to unsustainable water use and conflicts among users. It is imperative to establish proper policies and planning, adaptation strategies, and mitigation measures for climate change. Managing Mongolia's energy security problems (particularly for mining and hydropower) and rising demands on food security will make water management even more critical in harnessing socioeconomic development.

6. The government is putting significant attention on improving its legal and institutional framework for integrated water resource management and environmental protection of river basins in Mongolia. The Water Law (2012) serves as an umbrella law for water resources management, providing a legal and institutional framework for integrated water resources management (IWRM).[5] In 2010, Mongolia was divided into 29 river basins to improve water resources management. Introducing the concepts of river basin councils and river basin authorities paved the way for decentralization and community involvement in water management. The Water Law formally established river basin authorities throughout the country starting in 2012.[6] The government also approved a National Integrated Water Resources Management Plan, under which 13 basin-level IWRM plans were prepared to date.[7] However, many institutional challenges remain to be overcome, such as the need for (i) intergovernment coordination; (ii) stronger stakeholder coordination through river basin councils; (iii) better data collection, monitoring, and management (now dispersed and poorly managed); (iv) finances for effective execution of water management; and (v) better-trained water management personnel. Although a number of studies on water resources and water management exist and provide some background information on a few aspects of water resources management and water security in Mongolia, there are issues of poor data quality and lack of information in a number of key assessment areas including (i) water intensity in industry, (ii) water related natural disasters, (iii) water for energy and energy for water, (iv) environment and ecosystem health, and (v) tracking water governance. To address these issues, the government of Mongolia recognizes the need to employ more rigorous and systematic approaches to comprehensively understand water security

7. The Asian Water Development Outlook 2013[8] measures water security in five dimensions: household water security, economic water security, urban water security, environmental water security, and resilience to water-related disasters. This five-dimension framework provides a good basis for the regional developing member countries to conduct country water security assessment.

8. Given rapidly changing growth dynamics and the pressing need to integrate sustainable development planning, ADB and the government have agreed to conduct a CWSA for Mongolia. This assessment will adopt the five-dimension framework which is presented in Asian Water

[5] Ministry of Environment and Green Development. 2012. *Integrated Water Management National Assessment Report*. Ulaanbaatar.

[6] As of 2013, river basin authorities had been established for 23 of the 29 river basins.

[7] Within this new legal and institutional framework, ADB is currently preparing a project to assist the Tuul River Basin Authority with implementation of its IWRM plan. The Proposed Loan for Tuul River Cleanup and Rehabilitation for Mongolia is under processing and is expected to be approved in 2015.

[8] ADB. 2013. *Asian Water Development Outlook*. Manila.

Development Outlook. The proposed TA for the CWSA will be used to improve policies and strategies in the water sector, particularly to improve national water security and deal with water scarcity. The Mongolia CWSA will also support the preparation of a national water security management strategy, and will ensure that ADB's strategy and programs respond to water security challenges in Mongolia and are consistent with Mongolia's water policy directions.

9. Conducting a CWSA for Mongolia is consistent with ADB's Water Operational Plan, Knowledge Management Directions and Action Plan, and the Midterm Review of Strategy 2020.[9] It is also in line with ADB's Mongolia interim country partnership strategy, 2014–2016, which supports the government's goal of building a harmonious society by promoting environmentally sustainable development, and in particular aims to help Mongolia adapt to impacts of climate change by supporting the efficient use and sustainable management of natural resources.[10] Furthermore, outputs from the CWSA exercise will help contribute to Mongolia's National Development Strategy of 2007,[11] which contains specific environment-related directions for 2007–2021, as well as the 2012 Government Action Program, which includes a number of key priorities related to the natural resources sector.[12]

III. THE POLICY AND ADVISORY TECHNICAL ASSISTANCE

A. Impact and Outcome

10. The expected impact of the TA will be increased water security through improved water governance in Mongolia. The expected outcome will be policy recommendations and investments for strengthening water security approved by the government.

B. Methodology and Key Activities

11. The TA will result in a program for development of sound water management systems and greater operational capacity for water management in Mongolia. The TA will produce the following outputs: (i) CWSA completed, (ii) proposed program of investments and technical assistance prepared, and (iii) CWSA results and stakeholder consultations documented.

12. **Output 1: Country water security assessment completed.** Under this output, the TA will produce a CWSA report that will cover (i) a water resources profile; (ii) international best practices and implications for Mongolia's water security management; (iii) a set of water security case studies based on the Asian Water Development Outlook approach, including (a) household water security (e.g., herder communities), (b) economic water security (e.g., irrigation for agriculture and energy use in South Gobi), (c) urban water security (e.g., Ulaanbaatar), (d) environmental water security (e.g., Altai Mountains), and (e) resilience to water-related disasters (e.g., drought preparedness); the case studies will present existing and potential future water security dynamics and present recommendations and strategies for improving national water security; and (iv) assessment of water security risks and water management options.

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[9] ADB. 2011. *Water Operational Plan*. Manila; ADB. 2013. *Knowledge Management Directions and Action Plan, 2013–2015: Supporting "Finance ++" at the Asian Development Bank*. Manila; ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

[10] ADB. 2014. *Interim Country Partnership Strategy: Mongolia, 2014–2016*. Manila.

[11] Government of Mongolia. 2007. *Millennium Development Goals-Based Comprehensive National Development Strategy of Mongolia*. Ulaanbaatar.

[12] Government of Mongolia. 2012. *The Government Action Program (2012–2016).* Ulaanbaatar.

13. **Output 2: Proposed program of investments and technical assistance prepared.** Under this output, a draft and final program of proposed investments and TA projects will be prepared in consultation with government stakeholders, including the Ministry of Environment and Green Development (MEGD), Ministry of Finance, and other related ministries and entities such as, but not limited to, the Ministry of Health, Ministry of Industry and Agriculture, Tuul River Basin Authority, Water Supply and Sewerage Authority of Ulaanbaatar City, Water Resources Group, Mongolian National Water Committee, and National Security Council.

14. **Output 3: Country water security assessment results and stakeholder consultations documented.** Under this output, two stakeholder consultation workshops will be held to disseminate and solicit consensus on the results of the CWSA. The CWSA report will be submitted to MEGD and the National Security Council for endorsement.

15. The TA assumes that the government at various levels is committed to the preparation and implementation of IWRM plans and that the government will adopt a risk based approach to water management to ensure water security. The realization of the TA's expected impact may be at risk if the government's investment is insufficient, and if capacity for water management is inadequate. This potential risk will be managed through ongoing dialogue with MEGD and ongoing consultations with key stakeholders throughout TA preparation and implementation.

16. MEGD's strong leadership, vision, and ownership, demonstrated throughout the ongoing relationship of ADB and Mongolia, will mitigate the possible risks and ensure efficient and effective implementation of the TA. It is expected that MEGD and other concerned stakeholders will continue to exhibit strong commitment and a sense of ownership, which will ensure their active participation in the preparation of the CWSA. Extensive consultations and planning meetings with involved stakeholders, ranging from officials from MEGD, Ministry of Health, Tuul River Basin Authority, Water Supply and Sewerage Authority of Ulaanbaatar City, Water Resources Group, Mongolian National Water Committee, and National Security Council will continue to be held to further conceptualize the assistance and how best to add value, help the government manage the risk of water scarcity and insecurity, and ensure that all sectors are fully aware of the new development approaches and opportunities.

C. Cost and Financing

17. The TA is estimated to cost $525,000, of which $500,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-V). The government will provide counterpart support in the form of office facilities, administrative and logistical support for consultants, including translation and transportation, and other in-kind contributions.

D. Implementation Arrangements

18. MEGD will be the executing agency, while MEGD's Green Development Policy and Planning Department will be the implementing agency of the TA. A steering committee chaired by MEGD will be established, which may include officials from the National Security Council, National Water Committee, Ministry of Energy and Mining, Ministry of Economic Development, Ministry of Finance,[13] Ministry of Industry and Agriculture, Ministry of Health, Ministry of Construction and Urban Development, Water Supply and Sewerage Authority of Ulaanbaatar

[13] In the coming months, the Ministry of Economic Development and the Ministry of Finance will be merged, subject to parliamentary approval.

City, and others. MEGD will provide dedicated staff to act as focal points for the coordination of TA activities. A TA management office will be established in the Green Development Policy and Planning Department with support of the International Cooperation Division of MEGD, to ensure day-to-day implementation and management of the TA.

19. Procurement under the TA will be conducted in accordance with ADB's Procurement Guidelines (2013, as amended from time to time). A firm or entity, comprising a team of three international consultants (12 person-months) and six national consultants (35 person-months), will be engaged to help implement the TA activities. The firm or entity will be engaged in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time) using the quality- and cost-based selection method, with a quality–cost ratio of 90:10, and by inviting simplified technical proposals. Proceeds of the TA will be disbursed in accordance with the *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

20. The TA will be implemented from 15 March 2015 to 15 June 2016. Under the supervision of ADB, the executing and implementing agencies and the firm will (i) lead TA implementation, (ii) assemble and support the specialists, and (iii) utilize the firm's pool of national and/or international expertise, as necessary, to achieve the TA outputs. The ADB team will collaborate closely with MEGD during TA implementation to ensure proper monitoring and evaluation of results, and maintain progress on plans for the CSWA exercise. ADB will undertake intensive review and supervision by fielding missions at critical stages of TA implementation—particularly inception, interim, and final missions; and by extending regular support from ADB headquarters. TA progress will be measured against the design and monitoring framework, the consultants' terms of reference, and the TA progress reports. TA results will be disseminated through the release of the project reports, TA workshops, and media releases.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $500,000 on a grant basis to the Government of Mongolia for the Country Water Security Assessment, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Increased water security through improved water governance in Mongolia	Goals and targets specified in the National Integrated Water Management Plan and Basin Integrated Water Management Plans fulfilled by 2020	MEGD's annual reports	**Assumption** The government at various levels is committed to implementing integrated water resource management plans The government adopts a risk based approach to water management to ensure water security **Risk** Government investment and capacity for water management are inadequate
Outcome Policy recommendations and investments for strengthening water security approved by the government	Emerging issues identified and practical interventions for ensuring water security prepared and adopted for inclusion in the next Mongolia CPS by 2017 Recommendations for water security and water management strategy considered by the government by December 2016	Mongolia CPS MEGD's annual work plan and budget	**Assumption** MEGD and concerned stakeholders have strong commitment and sense of ownership and will participate in the preparation of the CWSA **Risk** Lack of incentives for some agencies in the non-natural resource sector to participate actively
Outputs 1. CWSA completed	CWSA report published by June 2016, including (i) water resources profile, by July 2015 (ii) international best practices and implications for Mongolia's water security management, by July 2015 (iii) set of water security case studies based on the AWDO approach prepared by October 2015	TA review missions and reports Reports and documents related to the CWSA Consultants' reports Dialogue with MEGD, MOED, and National Security Council	**Assumptions** MEGD provides timely advice, guidance, review, and endorsement of outputs MEGD, National Security Council, and other relevant organizations view TA implementation as a priority, and provide necessary data for the assessments and case studies

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	(iv) assessment of water management options (options identified and analyzed) by November 2015		Consensus on the program reached through consultations with key stakeholders
2. Proposed program of investments and technical assistance prepared	Program of investments and technical assistance submitted to MEGD for endorsement by Q1 2016	Lending and nonlending pipeline	
3. CWSA results and stakeholder consultations documented	Two stakeholder consultation workshops completed and consensus on the CWSA obtained (November 2015; March 2016)	Reports of the two stakeholder workshops	
	CWSA submitted to MEGD, National Security Council, and ADB Management for approval by Q2 2016	Dialogue with MEGD, MOED, and National Security Council	
Activities with Milestones **1. CWSA completed** 1.1 Existing information and data studied, gaps identified, and opportunities for leverage and value addition determined by June 2015 1.2 Water resources profile prepared by July 2015 1.3 International best practices and implications for Mongolia's water security management prepared by July 2015 1.4 Set of water security case studies based on the AWDO approach prepared by October 2015 1.5 Assessment of water management options identified and analyzed by November 2015 **2. Proposed program of investments and technical assistance prepared** 2.1 Draft program prepared by November 2015 2.2 Final program prepared by February 2016 **3. CWSA results and stakeholder consultations documented** 3.1 Draft CWSA report prepared by March 2016 3.2 First stakeholder consultation workshop completed by November 2015 3.3 Draft final report prepared by February 2016 3.4 Second stakeholder consultation workshop completed by March 2016 3.5 Final report completed by June 2016			**Inputs** **ADB: $500,000** Note: The government will provide counterpart support in the form of office facilities, administrative and logistical support for international and national consultants, including translation and transportation, and other in-kind contributions

ADB = Asian Development Bank, AWDO = Asian Water Development Outlook, CPS = country partnership strategy, CWSA = country water security assessment, MEGD = Ministry of Environment and Green Development, MOED = Ministry of Economic Development, TA = technical assistance.
Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

($'000)

Item	Amount
Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	255.0
ii. National consultants	120.0
b. International and local travel	25.0
c. Reports and communications	10.0
2. Workshops, local training, seminars, and conferences[b]	15.0
3. Equipment[c]	15.0
4. Miscellaneous administration and support costs[d]	10.0
5. Contingencies	50.0
Total	**500.0**

Note: The technical assistance (TA) is estimated to cost $525,000, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of office facilities, administrative and logistical support for consultants, including translation and transportation, and other in-kind contributions. The value of government contribution is estimated to account for 5% of the total TA cost.

[a] Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-V).

[b] To be administered by the consulting firm.

[c] Includes computers, printer, global positioning system, etc. Upon completion of the TA, equipment will be turned-over to the executing agency.

[d] Includes interpreter and publication of reports.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Required Expertise

1. The Asian Development Bank (ADB) will provide technical assistance (TA) to Mongolia to support the Country Water Security Assessment (CWSA). A firm or entity, comprising a team of three international consultants (12 person-months) and six national consultants (35 person-months) as indicated in Table A3.1, will be engaged to support TA implementation. The firm or entity will be engaged in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time) using the quality- and cost-based selection method, with a quality–cost ratio of 90:10, and by inviting simplified technical proposals. Consultants will be mobilized by March 2015.

Table A3.1: Summary of Consulting Services Needed

International Positions	person-months	National Positions	person-months
Water resources specialist and team leader	6.0	Water resources management specialist and deputy team leader	9.0
Water resources economist	3.0	Water supply and sanitation specialist	6.0
Institutional water management specialist	3.0	Environment and climate change specialist	8.0
		Agricultural irrigation specialist	3.0
		Pasture management specialist	3.0
		Water–energy nexus specialist	6.0
Total	**12.0**		**35.0**

Source: Asian Development Bank.

2. The team leader will have overall substantive and administrative responsibility for effective and timely TA implementation. The deputy team leader will work closely with the team leader and team members to support inputs, and supervision and delivery of outputs. The team leader will be responsible for defining each team member's detailed tasks and deliverables at inception. Table A3.2 shows the distribution of the consultants' responsibilities by TA outputs.

Table A3.2: Responsibilities of Consultants by Output

	Output 1				Output 2	Output 3
Consultant	**Output 1.1**	**Output 1.2**	**Output 1.3**	**Output 1.4**		
International						
Water resources specialist and team leader	✓	✓	✓	✓	✓	✓
Water resources economist	✓	✓	✓	✓		✓
Institutional water management specialist		✓	✓	✓	✓	✓
National						
Water resources management specialist and deputy team leader	✓		✓	✓	✓	✓
Water supply and sanitation specialist	✓		✓	✓		
Environment and climate	✓		✓	✓		✓

Consultant	Output 1				Output 2	Output 3
	Output 1.1	Output 1.2	Output 1.3	Output 1.4		
change specialist						
Agricultural irrigation specialist			✓	✓		✓
Pasture management specialist			✓	✓		✓
Water–energy nexus specialist			✓	✓		✓

Note: Output 1—Country water security assessment prepared (Output 1.1: Water resources profile, Output 1.2: International best practices and implications for Mongolia's water security management, Output 1.3: Set of water security case studies based on the Asian Water Development Outlook approach, and Output 1.4: Assessment of water management options); Output 2—Program of investments and technical assistance prepared; Output 3—Country Water Security Assessment results and stakeholder consultations documented.
Source: Asian Development Bank estimates.

B. Terms of Reference

3. **Water resources specialist and team leader** (international, 6 person-months). The specialist and team leader will be responsible for providing technical and implementation support for the CWSA and provide overall guidance and supervision to team members. The specialist should have (i) a master's degree in natural resources management, water, or other related fields; and (ii) at least 10 years of relevant experience in water resources management, preferably with project-related experience in Mongolia. The team leader will have work experience on projects financed by international organizations; past experience with ADB will be preferred. The team leader will have overall substantive and administrative responsibility for effective and timely TA implementation. The team leader will guide the team, foster close coordination between team members (including coordination of inputs, quality control of reports, financial management, and technical guidance), and coordinate with executing and implementing agencies, other related government agencies, ADB, and international organizations undertaking related work in partnership with ADB. The team leader, with support from the deputy team leader, will (i) develop methodology and approach in line with the Guidance Note on the Design and Preparation of Country Water Assessment; (ii) prepare work plan and schedule; (iii) conduct and report on all missions; (iv) prepare draft and final programs of investments and technical assistance; (v) guide and facilitate the organization of stakeholder consultation workshops; (vi) provide periodic progress reports to ADB and the executing agency; (vii) consolidate inputs of team members into draft and final reports; (viii) oversee preparation of all outputs; and (ix) participate in stakeholder consultation workshops.[1]

4. **Water resources economist** (international, 3 person-months). The specialist should have (i) a master's degree or relevant qualification in natural resource economics, water resources management or other related fields; and (ii) at least 10 years of relevant experience in project design for water economic analysis, pricing, and demand and supply analysis. The specialist will be responsible for preparing output 3 and oversee relevant parts of other outputs.

[1] ADB. 2012. *Guidance Note: Design and Preparation of Country Water Assessments.* Manila.

The specialist will (i) prepare water use and demand assessment (following the Guidance Note on the Design and Preparation of Country Water Assessments; (ii) prepare case studies on economic water security; (iii) lead identification and analysis of water management options; (iv) identify measures to reduce demand or augment water supply with the water resources specialist; (v) prepare economic analysis and develop a water availability cost curve; (vi) develop future economic growth scenarios; (vii) participate in stakeholder consultation workshops; (viii) assist in preparation of draft and final programs of investments and technical assistance; and (ix) provide inputs to draft and final reports.

5. **Institutional water management specialist** (international, 3 person-months). The specialist should have (i) a master's degree or relevant qualification in natural resource economics, water resources management, or other related fields; and (ii) at least 10 years of relevant experience in project design involving institutional analysis and institutional capacity building in the water sector. The specialist will be responsible for the preparation of a water governance assessment (following the Guidance Note on the Design and Preparation of Country Water Assessments as well as providing inputs into other activities. The specialist will (i) review the existing legal and regulatory frameworks in water management, and assess their efficiency and effectiveness; (ii) describe responsibilities and authorities of existing government organizations involved in water management; (iii) describe responsibilities and authorities of the existing or proposed river basin organizations; (iv) assess the capacity of government organizations and river basin organizations; (v) describe the coping strategies of water users (i.e., herders, rural population, urban citizens, industry, mining, and electric power stations) in facing water shortages or quality constraints; (vi) participate as resource person in stakeholder consultation workshops; (vii) make institutional reform and capacity-building recommendations into the draft and final programs of investments and technical assistance; and (viii) provide inputs and recommendations on institutional analysis to the draft and final reports.

6. **Water resources management specialist and deputy team leader** (national, 9 person-months). The specialist should preferably have (i) a master's degree in water resources management, hydrology, hydrogeology, or other related fields; and (ii) at least 8 years of relevant experience in water management. The specialist will (i) prepare draft water availability, use, and demand assessments (following the Guidance Note on the Design and Preparation of Country Water Assessments; (ii) assist the preparation of water quality and water-related disaster risk assessments; (iii) provide inputs on water availability and water use to specialists responsible for the preparation of water security case studies; (iv) assist the identification and analysis of water management options; (v) participate as a resource person in stakeholder consultation workshops; (vi) provide inputs on interventions for improving water resource data collection and management to the draft and final programs of investments and technical assistance; (vii) provide inputs to the draft and final reports; (viii) coordinate activities of the national consultants; (ix) coordinate stakeholder consultation activities; and (x) liaise with the executing agency on project management.

7. **Water supply and sanitation specialist** (national, 6 person-months). The specialist should preferably have (i) a master's degree or relevant qualification in water supply, sanitation, water management, or other related fields; and (ii) at least 5 years of relevant experience in water supply projects. The specialist will (i) provide inputs on urban water use and demand for the water use and demand assessment; (ii) provide inputs on urban water management for the water governance assessment; (iii) prepare the case study on urban water security; (iv) assist identification and analysis of water management options for enhancing urban water security and urban household water security; (v) participate as a resource person in stakeholders consultation workshops; (vi) provide inputs on interventions for increasing urban water security

and urban household water security to the draft and final programs of investments and technical assistance; and (vii) provide inputs on urban water security and urban household water security to the draft and final reports.

8. **Environment and climate change specialist** (national, 8 person-months). The specialist should preferably have (i) a master's degree or relevant qualification in environmental science or other related fields; and (ii) at least 5 years of relevant experience in environment, climate change, and water risk management. The specialist will (i) prepare draft water quality assessments and a draft water-related disaster risk assessment following the Guidance Note on the Design and Preparation of Country Water Assessments; (ii) provide inputs on impacts of climate change and consequences of environmental degradation for the future water availability assessment, including by use of climate modeling where relevant to understanding future water security under climate change scenarios; (iii) provide inputs on environmental protection and management for the water governance assessment; (iv) prepare case studies on environmental water security and resilience to water-related disasters; (v) assist identification and analysis of water management options for enhancing environmental water security and increasing resilience to water-related disasters; (vi) participate in stakeholder consultation workshops; (vii) provide inputs on interventions for increasing environmental water security and resilience to water-related disasters to the draft and final programs of investments and technical assistance; and (viii) provide inputs on environmental water security and resilience to water-related disasters to the draft and final reports.

9. **Agricultural irrigation specialist** (national, 3 person-months). The specialist should preferably have (i) a master's degree or relevant qualification in irrigation engineering, agricultural water resources management, or other related fields; and (ii) at least 5 years of relevant experience in the fields of design and operation of irrigation systems, and sustainable land and water management. The specialist will (i) provide inputs on irrigation water use and demand for the water use and demand assessment; (ii) provide inputs on agriculture water management for the water governance assessment; (iii) prepare a case study on economic water security focusing on increasing agricultural production through irrigation development; (iv) identify and analyze water management options for enhancing economic water security in the irrigated agriculture sector; (v) participate in stakeholder consultation workshops; (vi) provide inputs on interventions for increasing economic water security in the agriculture sector to the draft and final programs of investments and technical assistance; and (vii) provide inputs on economic water security in the agriculture sector to the draft and final reports.

10. **Pasture management specialist** (national, 3 person-months). The specialist should preferably have (i) a master's degree or relevant qualification in agricultural sciences, animal husbandry, or other related fields; and (ii) at least 5 years of relevant experience in the fields of sustainable pasture land and water management, and livestock management. The specialist will (i) prepare pasture land management and related water use and demand assessments; (ii) provide inputs on pasture land and water management for the water governance assessment; (iii) prepare a case study on household water security for herder communities; (iv) assist identification and analysis of water management options for enhancing household water security for herder communities; (v) participate in stakeholder consultation workshops; (vi) provide inputs on interventions for increasing household water security for herder communities to the draft and final programs of investments and technical assistance; and (vii) prepare the draft and final reports.

11. **Water–energy nexus specialist** (national, 6 person-months). The specialist should preferably have (i) a master's degree or equivalent in engineering, energy analysis, or other

related fields; and (ii) at least 5 years of relevant experience across the water–energy sectors, energy, and water analysis, energy for water, water for energy, and/or water–energy economics. The specialist will (i) provide inputs on the energy sector's water use and demand management; (ii) provide estimates of energy use by the water sector; (iii) provide inputs on energy and water nexus management for the water governance assessment; (iv) prepare the case study on economic water security (e.g., South Gobi mineral and energy development); (v) assist identification and analysis of water management options for enhancing economic water security in the energy sector; (vi) participate in stakeholder consultation workshops; (vii) provide inputs on interventions for increasing economic water security in the energy sector to the draft and final programs of investments and technical assistance; and (viii) provide inputs on economic water security for energy to the draft and final reports.

C. Coordination and Reporting Requirements

12. The executing agency will establish a cross-agency expert panel to ensure institutional coordination and quality of the CWSA preparation. The team leader and deputy team leader will organize inception, interim, and final workshops to review the consulting team's outputs. The consultant, represented by the team leader, will submit to the executing and implementing agencies and ADB an electronic copy and a hard copy (both in Mongolian and Chinese) of the inception (month 2), interim (month 7), final report (month 15), and each subreport. The draft knowledge product will be submitted in month 12 and the final knowledge product in month 15. The delivery schedule is tentative and will be confirmed in the consultant's work plan to be prepared in month 1.