



Technical Assistance Report

Project Number: 48440-002
Project Preparatory Technical Assistance (PPTA)
September 2015

Islamic Republic of Afghanistan: Preparing the Kabul Managed Aquifer Recharge Project (Cofinanced by the Afghanistan Infrastructure Trust Fund)

Distribution of this document is restricted until it has been approved by the Board of Directors. Following such approval, ADB will disclose the document to the public in accordance with ADB's Public Communications Policy 2011.

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 3 September 2015)

Currency unit	–	afghani/s (AF)
AF1.00	=	\$0.01581
\$1.00	=	AF63.25

ABBREVIATIONS

ADB	–	Asian Development Bank
COBP	–	country operations business plan
JICA	–	Japan International Cooperation Agency
lpcd	–	liters per capita per day
m	–	meter
MAR	–	managed aquifer recharge
MEW	–	Ministry of Energy and Water
NPP	–	national priority program
PMO	–	project management office
TA	–	technical assistance

NOTE

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

Vice-President	W. Zhang, Operations 1
Director General	S. O'Sullivan, Central and West Asia Department (CWRD)
Director	A. Siddiq, Environment, Agriculture and Natural Resources, CWRD
Country Director	T. Panella, Afghanistan Resident Mission (AFRM), CWRD
Team leader	H. Woldring, Senior Water Resources Specialist, AFRM, CWRD
Team members	L. Abenojar, Senior Operations Assistant, CWRD
	A. Ali, Principal Water Resources Specialist, CWRD
	M. H. Ayubi, Senior Project Officer (Natural Resources and Agriculture), AFRM, CWRD
	S. Campbell, Senior Social Development Specialist (Gender and Development), CWRD
	B. Debnath, Principal Social Development Specialist (Safeguards), CWRD
	N. Djenchuraev, Senior Environment Specialist, CWRD
	D. Perkins, Senior Counsel, Office of the General Counsel
	M. R. Yousofzai, Associate Safeguards Officer, AFRM, CWRD
Peer reviewer	F. Radstake, Principal Environment Specialist, East Asia Department

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

	Page
PROJECT PREPARATORY TECHNICAL ASSISTANCE PROJECT AT A GLANCE	
I. INTRODUCTION	1
II. ISSUES	2
III. THE PROPOSED PROJECT PREPARATORY TECHNICAL ASSISTANCE	3
A. Impact and Outcome	3
B. Methodology and Key Activities	3
C. Cost and Financing	3
D. Implementation Arrangements	3
IV. THE PRESIDENT'S RECOMMENDATION	4
APPENDIXES	
1. Design and Monitoring Framework	5
2. Cost Estimates and Financing Plan	7
3. Outline Terms of Reference for Consultants	8
4. Initial Poverty and Social Analysis	12

PROJECT PREPARATORY TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data		Project Number: 48440-002	
Project Name	Kabul Managed Aquifer Recharge Project	Department /Division	CWRD/CWER
Country Borrower	Afghanistan, Islamic Republic of Ministry of Finance	Executing Agency	Asian Development Bank
2. Sector	Subsector(s)	Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Land-based natural resources management	7.60	
		Total	7.60
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	Low
Environmentally sustainable growth (ESG)	Disaster risk management Urban environmental improvement		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Knowledge solutions (KNS)	Knowledge sharing activities	Some gender elements (SGE)	✓
Partnerships (PAR)	Pilot-testing innovation and learning Bilateral institutions (not client government) Official cofinancing		
5. Poverty Targeting		Location Impact	
Project directly targets poverty	Yes	Not Applicable	
Geographic targeting (TI-G)	Yes		
6. TA Category:	B		
7. Safeguard Categorization	Not Applicable		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		0.00	
None		0.00	
Cofinancing		7.60	
Afghanistan Infrastructure Trust Fund		7.60	
Counterpart		0.20	
Government		0.20	
Total		7.80	
9. Effective Development Cooperation			
Use of country procurement systems		No	
Use of country public financial management systems		No	

I. INTRODUCTION

1. The Kabul Basin is the most important river basin in Afghanistan. It is home to 35% of the country's population, including half of the urban population. Kabul is the fifth fastest-growing city in the world. Its population in mid-2014 was estimated at 4.5 million and is expected to increase to about 8 million by 2050.¹

2. The Government of Afghanistan requested assistance to support integrated river basin and water resources management to provide water to Kabul's growing population. The project is relevant to Afghanistan's national priority programs (NPPs), particularly to NPP 4—Agriculture and Rural Development Cluster, and NPP 5: Infrastructure Development Cluster. The government commitment to these NPPs was reinforced in *Towards Self Reliance: Strategic Vision for the Transformation Decade*.² In addition, urban water supply was identified as a priority in the Afghanistan National Development Strategy (2008–2013), which stated that “few places in the world face such scarce and alarming water supply and sanitation coverage levels”.

3. Managed aquifer recharge (MAR) takes advantage of water supplies available during the snowmelt and rainy seasons when river flows through Kabul are 15 times greater than in the dry season, and augments aquifer recharge for future use. MAR can help stabilize or raise shallow groundwater levels, improving the availability of primary water supplies for potable use and making Kabul urban water supplies more secure. In addition, MAR has the potential to support the development of commercial well-fields to supply water to the piped water network. However, groundwater often suffers from microbial and chemical pollutants, and requires treatment to meet potable water standards.

4. Many studies have been carried out over the past 35 years into the characteristics and performance of the Kabul Basin shallow and deep aquifers, significantly the Russian “Passport” study of 1982, and more recently by development partners including the Danish Committee for Aid to Afghan Refugees, the Japan International Cooperation Agency (JICA), the German development cooperation through KfW, the United States Agency for International Development, and the United States Geological Survey. KfW and United States Agency of International Development have also been active in urban water supply. A key recommendation of a 5-year program funded by JICA (2011) was the need to use “artificial recharge” to strengthen sustainable groundwater yields.³

5. The ensuing project will support agriculture and natural resources (including irrigation and water resource management). The country operations business plan for Afghanistan of the Asian Development Bank (ADB), 2015–2017⁴ indicates that the Afghanistan Infrastructure Trust Fund,⁵ approved by the ADB Board of Directors in November 2010, will facilitate additional investment from the financing partners. The preliminary design and monitoring framework is in Appendix 1.

¹ The TA first appeared in the business opportunities section of Asian Development Bank (ADB) website on 27 August 2015.

² Government of Afghanistan. 2012. *Towards Self Reliance: Strategic Vision for the Transformation Decade*. Tokyo Conference on Afghanistan. Tokyo, Japan.

³ JICA. 2011. *The Study on Ground Water Resources Potential in Kabul Basin in the Islamic Republic of Afghanistan*. Kabul: Ministry of Mines (final report).

⁴ ADB. 2014. *Country Operations Business Plan: Afghanistan, 2015–2017*. Manila.

⁵ Financing partners: the governments of Japan, the United Kingdom, and the United States. Administered by ADB.

II. ISSUES

6. Most Kabul residents are undersupplied with water, averaging about 16 liters per capita per day (lpcd),⁶ compared with a desirable level of a minimum of 80 lpcd and a rate of over 200 lpcd for water piped to homes in developed countries. Unmet water demand is many times the current supply. Presently, most water sourced from groundwater requires treatment. However, domestic purification systems cannot always achieve potable water quality.

7. As a result of a lack of water storage and the seasonal variability of river flows, Kabul is among the world's most water-stressed cities. It depends almost entirely on groundwater from four aquifers in the Logar–Upper Kabul river basin, with the majority of water coming from the shallow aquifer, reaching to 150 meters–200 meters (m) in depth. Most households use privately owned and dug tube wells within the urban and peri-urban area, with many households, particularly in the informal hillside settlement areas, relying on expensive tanker-delivered water.

8. Water tables under Kabul vary considerably, typically from 30 m to 70 m, depending on the distance from the main riverine recharge source and the extent of local extraction. A study conducted by the US Geological Survey between 2004 and 2012 showed that groundwater levels in Kabul city had fallen by an average of 1.5 m a year between 2008 and 2012. Overdraw in 2011 was estimated at 9.2% of supply (footnote 2). As water tables fall, the cost of pumping water and digging, drilling, or deepening wells will rise. With per capita water demand expected to double over the next 15–20 years, combined with population growth, urban water supplies will be under increasing pressure.

9. Shallow aquifer groundwater quality is compromised by the absence of proper latrine facilities, unregulated refuse disposal, and open sewerage channels. In addition, wastewater from both domestic and industrial sources is released into the Kabul river and contributes to river and shallow aquifer contamination. Hence, chemical and or bacterial pollutants are very common in untreated groundwater.

10. Piped water supplied by the Afghanistan Urban Water Supply and Sewerage Corporation meets potable standards, but reaches only 10% of the population. At the household level, domestic treatment technologies may or may not be able to achieve potable water standards, depending on the nature of pollutants. The quality and extent of water treatment at the household level are known to vary widely.

11. MAR can provide a low-cost solution to improve urban, rural, and agricultural water supplies by increasing annual recharge to groundwater storage. The technology is in use in numerous countries, but is new to Afghanistan. In the urban context, water quality is of paramount importance, and education, water quality monitoring, and appropriate technologies are important to help achieve potable water quality.

⁶ World Bank. 2010. *Afghanistan: Scoping Strategic Options for Development of the Kabul River Basin, A Multisectoral Decision Support System Approach*. Washington, DC.

III. THE PROPOSED PROJECT PREPARATORY TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The indicative impact of the proposed ensuing project is aligned with proper management of existing water and other natural resources. The outcome of the proposed project is increased availability of groundwater for Kabul. The project has four outputs (i) Kabul basin MAR infrastructure operational, (ii) capacity of the communities and staff built in water monitoring and management, (iii) aquifer protection zone/s performing, and (iv) legislative and regulatory reforms available.

B. Methodology and Key Activities

13. The project preparatory technical assistance (TA) will (i) assess the technical feasibility of MAR through pilot-testing in the greater Kabul city basin area—small-scale MAR technical options such as infiltration ponds will be introduced and tested along the Kabul river valley on the southern Kabul basin, and, depending on security, the Logar valley; (ii) build the capacity of and strengthen key government agencies; (iii) conduct a feasibility study and compare MAR with other potential solutions to Kabul's water problems (including dam construction and interbasin transfer); and (iv) prepare the detailed engineering and design documentation, and all bid, safeguards, and other loan documents, in accordance with ADB requirements,⁷ on condition that the study determines MAR to be a technically and economically viable contributor to Kabul's medium-term potable water needs. Key activities are further detailed in Appendix 1.

C. Cost and Financing

14. The TA is estimated to cost \$7.80 million, of which \$7.60 million will be financed on a grant basis by the Afghanistan Infrastructure Trust Fund and administered by ADB.⁸ The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, administrative assistance, office space, communication facilities for consultants, and other in-kind contributions. The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

15. The Ministry of Finance will be the executing agency and the Ministry of Energy and Water (MEW) the implementing agency. The consultants will report to ADB and MEW and will be responsible for their own security. MEW will coordinate with potential stakeholders.⁹ The TA has a 45 month implementation period.

16. The project oversight body is the project steering committee, comprising the Ministry of Finance (chair), MEW, the National Environment Protection Authority, the Ministry of Urban Development Affairs, Kabul Municipal Authority, and security agencies. The project steering

⁷ As the consultants carrying out the detailed design will be engaged directly by ADB rather than by the project executing or implementing agency (as is normally the case for consulting contracts providing for the preparation of detailed designs), it will be a condition to ADB's provision of the project preparatory TA that the government agree (through the TA letter) that ADB shall not be held liable in any manner for any defects in such detailed design.

⁸ Since these funds will be administered by ADB, ADB's procurement and consulting procedures shall apply.

⁹ Afghanistan Urban Water Supply and Sewerage Corporation; Kabul Municipal Authority; Afghanistan Land Authority; National Environment Protection Authority; Ministry of Urban Development Affairs; Afghanistan Geological Survey; Kabul University; Ministry of Agriculture, Irrigation and Livestock; Ministry of Rural Rehabilitation and Development; and civil society organizations.

committee will (i) provide the necessary assistance and guidance to ensure that the project is implemented efficiently within the overall policies and guidelines of the government and ADB; (ii) monitor overall project implementation; (iii) ensure close coordination between project activities and activities sponsored by other development partners; (iv) ensure that ADB is informed in a timely manner of project progress and any issues arising; and (v) hold six monthly meetings or as required, or following review missions.

17. The TA will use a performance-based consulting contract with an estimated value of \$6.45 million. Key positions are detailed in Table A3.2, with an estimated 87 person-months of international consulting services and 59 person-months of national consultants for the key positions.¹⁰ It is anticipated that a total of 132 person-months of international consulting services and 204 person-months of national consultants will be required. The consultants will be engaged through an international firm, associated with a national firm, by ADB in accordance with its Guidelines on the Use of Consultants (2013, as amended from time to time). Consultant selection will be through quality- and cost-based selection at a ratio of 90:10 technical:financial. Subject to ADB approval, the consultant firm will be responsible for the procurement and management of (i) small-scale civil works associated with the pilot projects; and (ii) test bore drilling services, as required, both using shopping method. The composition of the key positions in the consultant team is detailed in Appendix 3.

18. Project information will be strategically disseminated through the media at main milestones, including grant signing, contract awards, and project completion. The project management office will (i) designate a focal point for regular contact with project-affected people and other stakeholders; (ii) identify mechanisms for feedback during design and implementation; (iii) determine details of types of information to be disclosed, mechanisms for public notice, including language and timing, and responsibility for implementing and monitoring disclosure and dissemination, and (iv) identify activities to promote necessary knowledge and behavior change that will closely link to participation activities and plans.

IV. THE PRESIDENT'S RECOMMENDATION

19. The President recommends that the Board approve ADB administering technical assistance not exceeding the equivalent of \$7,600,000 to the Government of Afghanistan to be financed on a grant basis by the Afghanistan Infrastructure Trust Fund for preparing the Kabul Managed Aquifer Recharge Project.

¹⁰ Table A3.2: Summary of Key Consultant Positions and Estimate of Person-Months (accessible in Appendix 3).

DESIGN AND MONITORING FRAMEWORK

Impact of the Project is aligned with:

Proper management of existing water and other natural resources.^a

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Increased groundwater availability for Kabul	By 2024: Annual aquifer recharge increased to 30,500 ML (2015 baseline: 22,500 ML/year) Potable water supply from shallow groundwater sources increased to 10,000 ML/year (2015 baseline: 6,000 ML/year)	MEW's well data records MEW and Afghanistan Urban Water Supply and Sewerage Corporation records	Government's priority change or climate change reduces the river flow to less than the requirement for aquifer recharge
Outputs 1. Kabul basin MAR infrastructure operational	1a. MAR works completed to enable annual recharge of 8,000 ML by 2023 (2015 baseline: None) 1b. From March to June, on average 60 ML/day of river flow is diverted to the recharge area by 2023 (2015 baseline: 0)	1a-1b. Gauge data reported in MEW QPR	Unstable security affects completion of civil works Unstable security leads to security cost escalation
2. Capacity of the communities and staff developed in water monitoring and management	2a. 500 community members, with not less than 40% women, trained in monitoring of water quantity and quality by 2023 (2015 baseline: 0) 2b. Water purification devices provided and demonstrated to communities at 30 test areas by 2023 (2015 baseline: 0) 2c. Communities submitted to MEW periodic monitoring reports for water table depth and basic water quality from 30 test sites by 2023 (2015 baseline: 0)	2a. MEW QPR 2b. MEW QPR 2c. Community monitoring reports and MEW QPR	Government does not enforce protection zone regulations
3. Aquifer protection zones performing	3a. A minimum of 200 hectares of aquifer protection zone developed and functional by December 2020 (2015 baseline: 0)	3a. Afghanistan Land Authority records	
4. Legislative and regulatory reforms available	4a. MEW endorsed the draft legislation or reform proposals for parliamentary approval by December 2022 (2015 baseline: none)	4a. MEW QPR	

Key Activities with Milestones**Output 1. Kabul basin MAR infrastructure operational**

- 1.1 Review bid documents and cost estimates prepared during project preparatory TA, and country-specific risk factors affecting procurement and/or project implementation and confirmed with government by August 2019.
- 1.2 Advertise contract packages for MAR construction works by September 2019.
- 1.3 Bid, evaluate bids, and award contracts by October 2020.
- 1.4 Start signing contracts, issuing notices by December 2020.
- 1.5 Construct civil works by December 2022.
- 1.6 Supervise construction by December 2022.
- 1.7 Test operation, contractor to correct deficiencies, and handover from contractors by March 2023.
- 1.8 Recruit and train staff to manage MAR by March 2023.
- 1.9 Manage and operate MAR facilities by December 2023.

Output 2. Capacity of the communities and staff developed in water monitoring and management

- 2.1 Review water quality monitoring program recommended by project preparatory TA, and modify if necessary, by December 2019.
- 2.2 Define required monitoring network by June 2020.
- 2.3 Implement community monitoring program, including data storage, analysis, and reporting by June 2021.
- 2.4 Based on solutions developed under project preparatory TA, provide required hardware to the communities at 60 test areas to achieve potable water quality and sustainable water supply by 2023.
- 2.5 Establish community reporting system to promote rapid feedback to MEW on specific issues relating to water quality or water table changes by December 2021.
- 2.6 Define and implement community education programs to communicate drinking water safety and security messaging by June 2022.

Output 3: Aquifer watershed protection zones performing

- 3.1 Identify aquifer protection zone by December 2019.
- 3.2 Draft protection zone regulations by December 2019.
- 3.3 Train MEW staff in monitoring of protection zones and legislative compliance by December 2020.

Output 4: Legislative and Regulatory Reforms available

- 4.1 Review recommendations for reform prepared in project preparatory TA by June 2020.
- 4.2 Draw up proposed amendments in close consultation with relevant authorities by December 2020.
- 4.3 Advocate the adoption of required regulatory and legislative changes with municipal and national authorities by December 2022.

Inputs

Asian Development Bank (ADF grant): \$1,000,000
 Afghanistan Infrastructure Trust Fund: \$19,000,000
 Government of Afghanistan: \$500,000

Assumptions for Partner Financing

Not applicable.

ADF = Asian Development Fund, MAR = managed aquifer recharge, MEW = Ministry of Energy and Water, ML = mega liter, NPP = national priority program, QPR = quarterly progress report, TA = technical assistance.

^a Government of Afghanistan. 2012. *National Priority Program 4. Agriculture and Rural Development Cluster, National Water and Natural Resources Development, Water Resources and Irrigation Development*. Kabul.

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

Item	Amount
Afghanistan Infrastructure Trust Fund^a	
1 Consultants	
a. Remuneration and per diem	
i. International consultants (total estimate 132 person-months)	4,341,200
ii. National consultants (total estimated 204 person-months)	888,000
b. International and local travel	375,000
c. Reports and communications	41,800
d. Pilot scheme engineering works and test drilling ^b	800,000
2 Equipment (computer, printer etc) ^c	20,000
3 Workshops, training, seminars, and conferences ^d	
a. Facilitators	20,000
b. Training program	380,000
4 Vehicle hire	140,000
5 Surveys	10,000
6 Miscellaneous and support costs ^e	50,000
7 Contract negotiations	4,000
8 Contingencies	530,000
Total	7,600,000

^a Financing partners: the governments of Japan, the United Kingdom, and the United States. Administered by ADB.

^b Contract drilling is for test core drilling where existing data is inadequate and incomplete. Drilling costs capped at \$15,000 per hole, and contracts for pilot works not to exceed \$100,000 each.

^c Equipment: computers, printers, software, and ground water logging equipment as required.

^d Workshops, training, seminars, and conferences. Purpose and locations as described in the project preparatory technical assistance. Equipment purchased will be turned over to the government upon Technical Assistance completion.

^e This includes audit costs and bank charges.

Source: Asian Development Bank.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The project preparatory technical assistance (TA) has allocated a budget of \$6.45 million for consulting services. An international consulting firm, associated with a national firm, will be engaged by the Asian Development Bank (ADB) and the Ministry of Energy and Water (MEW) through quality- and cost-based selection of 90:10 technical: financial in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Subject to ADB approval, the consultant firm will assist the project management office (PMO) with procurement and supervision management of the following services: (i) small-scale civil works associated with the pilot projects; and (ii) test bore drilling services, as required, both using shopping method.

2. The outcome of the project preparatory TA will be institutional capacity development in MAR and a well-prepared project. The TA will have five outputs: (i) pilot managed aquifer recharge facilities established and operational; (ii) capacity of participating stakeholders enhanced; (iii) Kabul basin MAR feasibility study, contingent on positive conclusions to feasibility study; (iv) detailed project design and documentation; and (v) project management. The consultant contract will be in two phases, with the second phase, being output (iv), subject to approval from MEW with no objection from ADB. Output and key activity details are as follows:

3. **Output 1: Pilot managed aquifer recharge facilities established and operational.** Pilot recharge facilities will be constructed on the Upper Kabul river, and the Logar river, depending on security. In each area where possible or appropriate, the following infrastructure is planned: Upper Kabul and Logar river—river offtake: (i) stilling basin, canal, and recharge basin; (ii) ditch injection; (iii) well injection; and (iv) contour banking. A second site will depend on security assessments closer to the time. The consultants will

- (i) identify two sites for pilot activities and define pilot MAR activities (location and type);
- (ii) prepare initial environmental examination and environmental monitoring plan;
- (iii) design offtake, stilling basin, canal, and recharge basins;
- (iv) assess potential to establish contour-bank recharge and implement if feasible;
- (v) define comprehensive physical, biological, and chemical parameters;
- (vi) define and implement monitoring system;
- (vii) prepare pilot facility tender documents;
- (viii) assemble and analyse data on the four main Kabul basin aquifers;
- (ix) supervise infrastructure construction;
- (x) select or contract the drilling and required equipping of reference wells;
- (xi) monitor static water level and quality parameters in 10 reference wells;
- (xii) ensure that water table and water quality are not negatively impacted;
- (xiii) prepare report on the implementation and results of pilot MAR activities;
- (xiv) recommend requirements and scope for establishing aquifer protection zones;
- (xv) survey of poverty, social, and health status indicators in pilot and main project areas; and
- (xvi) conduct post-completion water and land use surveys.

4. **Output 2: Capacity of participating stakeholders enhanced.** The capacity of participating stakeholders will be enhanced through demonstrations, workshops, and international study tours, to regional and nonregional countries. Excellent examples exist in India and the United States. The consultants will (i) assess the capacity and needs of key agencies; (ii) conduct at least 16 pilot project demonstrations, field days and workshops; (iii)

advise the PMO on suitable conferences and study tours and trainers for in-country workshops; and (iv) draft aquifer protection zone regulations.

5. **Output 3: Kabul Basin managed aquifer recharge studies.** A feasibility study on MAR will be prepared to examine the technical, environmental, climate change vulnerability, economic, social, health, and water quality aspects of MAR as they pertain to the greater Kabul city basin area. The feasibility study will draw on the experience of the pilot program. It will also compare MAR with other forms of domestic water augmentation in the basin. On completion, the feasibility study will be externally peer reviewed.

6. **Output 4: Kabul potable water managed aquifer recharge project design.** Provided that the feasibility study conclusions are positive, and contingent on approval by the government and ADB, the detailed engineering and design will be undertaken. Documentation will also need to be prepared as required for ADB loan approval, including a climate change vulnerability assessment, safeguards compliance documentation consistent with ADB's Safeguard Policy Statement (2009), and a financial and economic analysis in accordance with ADB's Guidelines for the Economic Analysis of Projects.¹ Output 5 is project management.

7. An international consulting firm, associated with a national firm, will be engaged by ADB and MEW through quality- and cost-based selection (90:10 technical: financial ratio) in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Subject to ADB approval, the consulting firm will procure and manage additional services such as (i) construction of small-scale civil works for demonstration and/or pilot facilities, and (ii) contract drilling where additional information is required on strata or water levels.

8. The consulting firm will support the PMO to maintain the project communication plan through the identification of activities to promote necessary knowledge and behavior change relevant to participation activities and plans.

A. Implementation Arrangements

9. MEW will be the implementing agency. The consultants will report to MEW and will be responsible for their own security. MEW and the consultants will coordinate with the Afghanistan Urban Water Supply and Sewerage Corporation and the Ministry of Urban Development Affairs. The project oversight body is the project steering committee.

10. The project preparatory TA processing and implementation schedule is in Table A3.1. The key positions under the performance based consulting contract are outlined in Table A3.2. In all cases where there are international and national consultants, they will share the same terms of reference and will divide tasks between themselves.

Table A3.1: Technical Assistance Processing and Implementation Schedule

Milestone	Expected Completion Date
Project preparatory TA approval	October 2015
Kabul MAR feasibility study	December 2016
Capacity building and demonstration	December 2018
Detailed design and procurement documentation	December 2018
Closing of project preparatory TA	June 2019

MAR = managed aquifer recharge, TA = technical assistance.
Source: Asian Development Bank.

¹ ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila.

Table A3.2: Summary of Key Consultant Positions and Estimate of Person-Months

Positions	Outputs 1–3		Output 4		Total	
	International	National	International	National	International	National
Ground water engineer and team leader	18	0	12	0	30	0
Ground water engineer and DTL	0	18	0	4	0	22
Senior ground water hydrologist	12	12	10	10	22	22
Ground water modelling specialist	10	10	6	5	16	15
Irrigation structural engineer	7	0	8	0	15	0
Expert panel	4	0			4	0
Total	51	40	36	19	87	59

DTL = deputy team leader.

Source: Asian Development Bank estimates.

B. Outline Terms of Reference of Key Experts

11. **Groundwater engineer and team leader and deputy team leader** (international, 30 person-months; national, 22 person-months). The experts will have at least first degrees in engineering with qualifications in river hydraulics, geohydrology, or related fields. The international expert will have 15 years of experience in the region. Prior experience in leading at least one ADB project preparatory TA project team is preferred. The national consultant will have at least 10 years of relevant experience. The consultant will

- (i) manage the TA and consultants;
- (ii) establish working, monitoring, and reporting procedures, including supervision of a nongovernment organization and national civil work contractors;
- (iii) prepare inception, monthly, and completion reports;
- (iv) review all activities and modify as required to ensure optimal outcomes;
- (v) based on the interim results of the pilot program, determine potential feasibility of the full MAR project and prepare feasibility study, including a short evaluation of alternative sources of potable water for Kabul;
- (vi) depending on the results of the feasibility study, prepare the detailed terms of reference for the MAR project in the format of ADB's report and recommendation of the President, suitable for financing; and
- (vii) allocate tasks related to Report and Recommendation of the President and linked document preparation to team members depending on their individual skills and time availability.

12. **Senior groundwater specialists** (international, 22 person-months; national, 22 person-months). The consultants will have degrees in hydrogeology or a related field. They will have 15 years and 10 years of relevant experience, respectively. Their tasks will include

- (i) collect data on all relevant Kabul River Basin aquifers;
- (ii) identify shallow and deep tube wells in the main aquifer zones;
- (iii) estimate current abstraction rates;
- (iv) identify options for recharge, including natural and manufactured recharge basins and injection;
- (v) cost the options for cost-effective pilot and main project solutions;
- (vi) recommend maximum river sediment load that is allowed for diversion to recharge basins; and

- (vii) recommend probable sites for main project water abstraction and recharge based on results from aerial and ground surveys.

13. **Groundwater modelling specialists** (international, 16 person-months; national, 16 person-months). The international specialist will have at least a master's degree and the national specialist a bachelor's degree in hydrogeology or a related discipline, 10 years' minimum experience, and will have developed at least two groundwater models. Working with the groundwater hydrologist, the consultant will

- (i) based on existing data and measurements from reference wells, define the characteristics of the aquifers in terms of hydraulic conductivity, specific storage and transmission and other characteristics deemed useful;
- (ii) define storage capacity of each aquifer in its current condition and current abstraction rates;
- (iii) estimate recharge needs, optimum rates and durations, and locations for a specific recharge area;
- (iv) based on available and measured data, calculate rainfall and runoff characteristics of land in the aquifer recharge zone;
- (v) review rainfall records and assess whether some of the pilot aquifer areas would benefit from contour banking to slow normal runoff; estimate the potential viability and cost of this option; if viable and cost-effective, organize pilot contour banking area; and assess impact; and
- (vi) from existing data and drilling records, develop a detailed model for the aquifer under the greater Kabul city to assist in preparation of the feasibility study.

14. **Irrigation structural engineers** (international, 15 person-months; national, 20 person-months). The consultants will have degrees in water resource and/or civil engineering. Their career will include a minimum of 5 years of experience in hydrological studies and analysis of water and river engineering projects. The consultant will

- (i) design all structures associated with the pilot recharge program: headworks, primary canal, sedimentation basin, and other structures used for aquifer recharge, main canal, recharge basins; and
- (ii) prepare tender documents, select construction contractors, supervise construction, and manage the pilot project infrastructure.

15. **Expert panel feasibility study review** (2 persons, international, total 4 person-months). The expert panel will

- (i) review the technical, social, environmental, and economic aspects of the feasibility study for use of different options to achieve MAR as a possible solution to improving the availability of groundwater for the greater Kabul urban area;
- (ii) provide considered and qualified advice to MEW and ADB as to the viability and risks of a MAR project for the greater Kabul urban area; and
- (iii) recommend the best way forward in relation to MAR as a possible solution for improved groundwater availability in the greater Kabul urban area.

16. Other specialists that the consulting firm may consider to deliver required outputs may include a social development specialist, a resettlement specialist, an environment specialist, a climate change hydrology specialist, a lawyer, a procurement specialist, a contracts specialist, a security advisor, an economist, and a financial management specialist.

INITIAL POVERTY AND SOCIAL ANALYSIS

Country:	Afghanistan	Project Title:	Kabul Managed Aquifer Recharge Project
Lending/Financing Modality:	Project	Department/ Division:	Central and West Asia Department/ Afghanistan Resident Mission

I. POVERTY IMPACT AND SOCIAL DIMENSIONS

A. Links to the National Poverty Reduction Strategy and Country Partnership Strategy

The project is relevant to Afghanistan's National Priority Programs (NPP), particularly to NPP 4—Agriculture and Rural Development Cluster, and 5—Infrastructure Development Cluster. NPP4.1 covers National Water and Natural Resources Development and includes responsibility for undertaking water harvesting projects to restore aquifers. The technical assistance (TA) also fits in well with the NPP's promotion of integrated river basin and water resources management. The infrastructure development cluster NPP5.4, the National Urban Delivery Program, prioritizes the development of water, drainage, and sewerage infrastructure. The urban water supply and sanitation sector was identified as a priority in the Afghanistan National Development Strategy (2008–2013), which indicated that “few places in the world face such scarce and alarming water supply and sanitation coverage levels.”

ADB's interim Afghanistan country partnership strategy (CPS, 2014–2015) supports the agriculture and natural resources sector (including irrigation and water resource management), and focuses on improved water resources management. The current country operational business plan (COBP 2015–2017) indicates that the Afghanistan Infrastructure Trust Fund, approved by the ADB Board of Directors in November 2010, will facilitate additional investment from financing partners during this COBP period. A project preparatory TA was included in the COBP 2015–2017.

The project will address the income and non-income dimensions of poverty through avoided health costs due to water contamination, and increased availability of domestic water supply of better quality from ground wells. The proposed project is also in line with ADB's fragile and conflict-affected situation approach, given that Kabul city's population is predicted to almost double from its present 4.5 million by 2050 and this, combined with the population's demand for adequate water will place great pressure on supplies. Internationally, critical constraints on a basic resource such as water are drivers of conflict and inequality.

B. Poverty Targeting

☐ General Intervention ☐ Individual or Household (TI-H) ☒ Geographic (TI-G) ☐ Non-Income MDGs (TI-M1, M2, etc.)

The project will benefit the majority of Kabul's population in terms of groundwater recharge for more reliable domestic water supply, improved domestic hygiene through behavior change management, and sustainable resource use through aquifer management and monitoring.

C. Poverty and Social Analysis

1. Key issues and potential beneficiaries. Kabul city is among the world's most water-stressed cities. It depends almost entirely on groundwater, either pumped from wells owned by water companies or from privately-owned dug-and tube-wells. Due to climate change and excess water extraction, water levels in many parts of the basin are falling, causing shallow wells to dry and tubewell output to decline. Government and households are faced with the cost of deepening or digging new wells and lowering pumps while many households particularly in the informal settlement areas, are forced to rely on expensive tanker-delivered water. Due to supply restrictions, water consumption in Kabul is estimated to average around 20 liters per capita per day (lpcd). This level is far below demand and only 20% of a “desirable” consumption level of 80 lpcd. Existing water supplies are often polluted, due to cross-contamination between toilets and wells, animal and human waste on the land surface, and the use of rivers as garbage dumps. Combined with inadequate supply leads to high levels of water-related disease and child mortality.

2. Impact channels and expected systemic changes. Greater availability and quality of groundwater for domestic use in Kabul city, and water for agricultural use in the Kabul hinterland. Addressing problems of supply and quality will benefit even the poor who pay for commercial water, through reduced risk of price hikes which could result from further scarcity and increasing demand.

^a ADB. 204. *Interim Country Partnership Strategy: Afghanistan, 2014–2015*. Manila; and ADB. 2014. *Country Operations Business Plan: Afghanistan, 2015–2017*. Manila. Financing partners for the Afghanistan Infrastructure Trust Fund are the governments of Japan, the United Kingdom, and the United States; and administered by ADB.

^b Food and Agriculture Organization of the United Nations. <http://www.fao.org/nr/water/issues/scarcity.html> (accessed 18 November 2014).

^c World Bank. 2010. *Afghanistan: Scoping Strategic Options for Development of the Kabul River Basin, A Multisectoral Decision Support System Approach*. Washington, DC (estimated 16 lpcd average).

3. Focus of (and resources allocated in) the project preparatory TA or due diligence. Social and gender analysis of water users will be undertaken to better quantify access to and control over water, water sufficiency and quality, incidence of water related ill health, knowledge and practices regarding water use and hygiene, disposal of solid waste and water affordability.

4. Specific analysis for policy-based lending. Not applicable.

II. GENDER AND DEVELOPMENT

1. What are the key gender issues in the sector or subsector that are likely to be relevant to this project or program? Women are disproportionately affected by poverty in general due to restrictions on movement, safety, and reduced access to education, jobs, and economic resources. In terms of water supply, water scarcity and contaminated water disproportionately affect women who must deal with the consequences of ill health and high resource costs. Where household finances are constrained, the education of girls and food for women and girls are sacrificed in a culture that prioritizes the needs of men and boys. All household work is done by women and girls while interaction with the outside world is the domain of men, severely limiting women's participation.

2. Does the proposed project or program have the potential to make a contribution to the promotion of gender equity and/or empowerment of women by providing women's access to and use of opportunities, services, resources, assets, and participation in decision making?

☒ Yes ☐ No

To the extent possible, women will be consulted and the project preparatory TA will explore opportunities for mobilization of women particularly for the health and hygiene output of the project. Improved water security and quality will have impacts on household work and family health outcomes which should reduce women's household work. Price stabilization (which is to be determined) would have positive impacts on intra-household resource allocation. Contributions to peace and stability will have positive implications for women's safety.

3. Could the proposed project have an adverse impact on women and/or girls or widen gender inequality?

☐ Yes ☐ No To be determined. All participation and consultation with women must be treated sensitively in Kabul to limit women's exposure to radical elements. Women in public positions face overt security risks.

4. Indicate the intended gender mainstreaming category:

☐ GEN (gender equity) ☐ EGM (effective gender mainstreaming)

☒ SGE (some gender elements) ☐ NGE (no gender elements)

III. PARTICIPATION AND EMPOWERMENT

1. The key stakeholders in the Kabul basin include:

- The population with access to central water distribution
- The population relying on shallow and deep wells, other private sources, tanker delivery, bottled water or (when available) surface supplies
- Large and small-scale industries and businesses
- The Kabul water companies
- Farmers using shallow or deep wells, irrigation canals, or rivers for irrigation
- Downstream users of Kabul river water, including the city of Jalalabad

Aynak copper mine and other potential mining developments in the basin, though Pell Frischmann (2012,p. 48) conclude that further copper mine development around Aynak is unlikely due to water shortage.

Participation via consultation will be undertaken to the extent possible given the security situation during the project preparatory TA.

2. How can the project contribute (in a systemic way) to engaging and empowering stakeholders and beneficiaries, particularly, the poor, vulnerable and excluded groups? What issues in the project design require participation of the poor and excluded?

The poor and excluded are located in greater concentrations in the informal settlements of Southern Kabul, and up the hillsides in and around Kabul, the latter with a high dependence on purchased water. The project preparatory TA will consider community monitoring of water for Output 3. The project preparatory TA will undertake more detailed stakeholder analysis and prepare a participation plan.

<p>3. What are the key, active, and relevant civil society organizations in the project area? What is the level of civil society organization participation in the project design?</p> <p><input checked="" type="checkbox"/> M Information generation and sharing M <input checked="" type="checkbox"/> Consultation <input type="checkbox"/> Collaboration <input type="checkbox"/> Partnership</p> <p>Consultation will be limited by the prevailing security environment as well as lack of water-sector local NGO/CSOs.</p>
<p>4. Are there issues during project design for which participation of the poor and excluded is important? What are they and how shall they be addressed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>The urban poor pay the most for water, hence understanding their access constraints and devising possible solutions will be a key aspect of the social analysis.</p>
IV. SOCIAL SAFEGUARDS
<p>A. Involuntary Resettlement Category <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI</p> <p>1. Does the project have the potential to involve involuntary land acquisition resulting in physical and economic displacement? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Preliminary research suggests that while no involuntary resettlement will be required under the pilot projects (project preparatory TA Output 1), under the full project, resettlement is likely to be required, to be confirmed by the project preparatory TA. The project will be tentatively categorized as B for the involuntary resettlement safeguard.</p> <p>2. What action plan is required to address involuntary resettlement as part of the project preparatory TA or due diligence process?</p> <p><input checked="" type="checkbox"/> Resettlement plan <input type="checkbox"/> Resettlement framework <input type="checkbox"/> Social impact matrix</p> <p><input type="checkbox"/> Environmental and social management system arrangement <input type="checkbox"/> None</p>
<p>B. Indigenous Peoples Category <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> FI</p> <p>1. Does the proposed project have the potential to directly or indirectly affect the dignity, human rights, livelihood systems, or culture of indigenous peoples? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>2. Does it affect the territories or natural and cultural resources indigenous peoples own, use, occupy, or claim, as their ancestral domain? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>3. Will the project require broad community support of affected indigenous communities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>No indigenous peoples based on the SPS definition.</p> <p>4. What action plan is required to address risks to indigenous peoples as part of the project preparatory TA or due diligence process?</p> <p><input type="checkbox"/> Indigenous peoples plan <input type="checkbox"/> Indigenous peoples planning framework <input type="checkbox"/> Social Impact matrix</p> <p><input type="checkbox"/> Environmental and social management system arrangement <input checked="" type="checkbox"/> None</p>
V. OTHER SOCIAL ISSUES AND RISKS
<p>1. What other social issues and risks should be considered in the project design?</p> <p><input type="checkbox"/> Creating decent jobs and employment <input checked="" type="checkbox"/> Adhering to core labor standards M <input type="checkbox"/> Labor retrenchment</p> <p><input type="checkbox"/> Spread of communicable diseases, including HIV/AIDS <input type="checkbox"/> Increase in human trafficking <input checked="" type="checkbox"/> Affordability M</p> <p><input type="checkbox"/> Increase in unplanned migration <input type="checkbox"/> Increase in vulnerability to natural disasters <input type="checkbox"/> Creating political instability</p> <p><input checked="" type="checkbox"/> Creating internal social conflicts M <input type="checkbox"/> Others, please specify _____</p> <p>2. How are these additional social issues and risks going to be addressed in the project design?</p> <p>Core labor standards: Afghanistan has known issues with child and forced labor, particularly in agriculture and brick making. Loan covenants will apply. Affordability of water for the poor is a potential benefit of this project. Social conflict can be a result of water insecurity. All three issues will be considered during the project preparatory TA social analysis.</p>
VI. PPTA OR DUE DILIGENCE RESOURCE REQUIREMENT
<p>1. Do the terms of reference for the project preparatory TA (or other due diligence) contain key information needed to be gathered during project preparatory TA or due diligence process to better analyze (i) poverty and social impact; (ii) gender impact, (iii) participation dimensions; (iv) social safeguards; and (v) other social risks. Are the relevant specialists identified?</p> <p><input checked="" type="checkbox"/> Yes Outputs from relevant specialists have been included in the project preparatory TA requirements.</p>
<p>2. What resources (e.g., consultants, survey budget, and workshop) are allocated for conducting poverty, social and/or gender analysis, and participation plan during the project preparatory TA or due diligence? The outputs required are specified and under the performance based contract.</p>

CSO = civil society organization, NGO = nongovernment organization, TA = technical assistance.

Source: Asian Development Bank.