Report and Recommendation of the President to the Board of Directors

Project Number: 49453-002
August 2019

Proposed Grant and Administration of Grant Republic of Kiribati: South Tarawa Water Supply Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 25 June 2019)

Currency unit	–	Australian dollar/s (A$)
A$1.00	=	$0.696
$1.00	=	A$1.436

ABBREVIATIONS

ADB	–	Asian Development Bank
DBO	–	design, build, operate
GCF	–	Green Climate Fund
KFSU	–	Kiribati Fiduciary Services Unit
MISE	–	Ministry of Infrastructure and Sustainable Energy
O&M	–	operation and maintenance
PAM	–	project administration manual
PDA	–	project design advance
PMU	–	project management unit
PUB	–	Public Utilities Board
WASH	–	water, sanitation, and hygiene

NOTE

In this report, "$" refers to United States dollars, unless otherwise stated.

Vice-President	Ahmed M. Saeed, Operations 2
Director General	Ma. Carmela Locsin, Pacific Department (PARD)
Director	Jingmin Huang, Urban Development, Water Supply and Sanitation Division, PARD
Team leader	Alexandra Conroy, Urban Development Specialist, PARD
Team members	Stephen Blaik, Principal Urban Development Specialist, PARD Ilaria Caetani, Principal Partnerships Specialist, Strategy, Policy and Partnerships Department Ninebeth Carandang, Senior Social Development Specialist, PARD Grace King, Senior Project Officer (Financial Management), Pacific Subregional Office in Suva, Fiji, PARD Kevin Moore, Senior Procurement Specialist, Procurement, Portfolio and Financial Management Department Deborah Robertson, Young Professional, Sustainable Development and Climate Change Department Antonietta Salvador, Senior Operations Officer, PARD Asghar Ali Syed, Principal Counsel, Office of the General Counsel Cinderella Tiangco, Senior Energy Specialist, PARD Cara Tinio, Economics and Statistics Analyst, PARD Jean Williams, Senior Environment Specialist, PARD
Peer reviewer	Massimo Petrone, Senior Urban Development Specialist, Central and West Asia Department

CONTENTS

PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 49453-002

Project Name	South Tarawa Water Supply Project	**Department /Division**	PARD/PAUW
Country	Kiribati	**Executing Agency**	Ministry of Finance and Economic Development
Borrower	Government of Kiribati		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ **Water and other urban infrastructure and services**	Urban water supply	13.00
	Total	**13.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information[1]**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	CO_2 reduction (tons per annum)	4,471
		Climate Change impact on the Project	High
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	**ADB Financing**	
	Urban environmental improvement	Adaptation ($ million)	1.16
		Mitigation ($ million)	1.61
		Cofinancing	
		Adaptation ($ million)	26.84
		Mitigation ($ million)	1.79

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Organizational development	Effective gender mainstreaming (EGM)	✓
Partnerships (PAR)	Civil society organizations		
	Official cofinancing		

5. Poverty and SDG Targeting		**Location Impact**	
Geographic Targeting	No	Urban	High
Household Targeting	No		
General Intervention on Poverty	Yes		
SDG Targeting	Yes		
SDG Goals	SDG1, SDG5, SDG6, SDG10, SDG13		

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** B **Indigenous Peoples:** C

8. Financing

Modality and Sources	Amount ($ million)
ADB	**13.00**
Sovereign Project grant: Asian Development Fund	13.00
Cofinancing	**41.59**
Green Climate Fund - Project grant (Full ADB Administration)	28.63
World Bank - Project grant (Not ADB Administered)	12.96
Counterpart	**7.24**
Government	7.24
Total	**61.83**

Currency of ADB Financing: USD

[1] The project reduces greenhouse gas emissions. However, it does not fall under the eligibility criteria for climate mitigation finance as defined by the joint multilateral development bank methodology on tracking climate finance, which notes that not all activities that reduce greenhouse gases in the short term are eligible to be counted towards climate mitigation finance. Accordingly, greenfield fossil fuel projects are excluded, and climate mitigation finance is considered zero.

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed grant to the Republic of Kiribati for the South Tarawa Water Supply Project. The report also describes the proposed administration of a grant to be provided by the Green Climate Fund (GCF) for the South Tarawa Water Supply Project, and if the Board approves the proposed grant, I, acting under the authority delegated to me by the Board, approve the administration of the grant.

2. The project will combat factors that result in the high incidence of waterborne disease in South Tarawa, the capital of Kiribati, through the delivery and effective management of new and rehabilitated climate-resilient water supply assets and of improved hygiene practices.

II. THE PROJECT

A. Rationale

3. **Public health**. South Tarawa is highly urbanized with a population of about 62,000 and an average population density of around 4,000 persons per square kilometer.[1] Natural resources (particularly land and potable water) are highly stressed. Overcrowding as well as inadequate water, sanitation, and hygiene (WASH) coverage are closely linked to waterborne diseases such as diarrhea and dysentery. A consistent increase in the incidence of diarrhea averaged approximately 860 new cases per year between 2002 and 2016.[2]

4. **Limited freshwater resources**. The Bonriki and Buota groundwater lenses are the only freshwater sources in South Tarawa that are suitable for producing drinking water, with a combined sustainable yield of about 2,000 cubic meters per day.[3] Since leakages from the water supply network are estimated at 67%, only about 700 cubic meters per day, or 11 liters per person per day are available to the population through the public water supply network—far below the 50 liters per person per day recommended to meet minimum health requirements.[4] The projected population growth means that, without intervention, the gap between supply and demand will continue to widen. Alternative sources such as household wells are deemed unsafe because of groundwater contamination from human and animal waste, while rainwater supplies cannot be relied upon during droughts.

5. **Climate change and disaster risk reduction**. Kiribati faces significant challenges because of its vulnerability to climate change and disasters triggered by natural hazards. Rising sea levels are of particular concern, since most land lies less than 3 meters above sea level. The quality and quantity of freshwater provided by the Bonriki and Buota lenses is seriously threatened by climate-change-induced inundation and extreme weather events, including prolonged droughts. The simultaneous or successive occurrence of inundation and drought could be catastrophic for water supplies in South Tarawa, effectively reducing the lenses' yield to zero for periods of up to 5 years. Taking a precautionary approach, the lenses cannot be relied upon as the main source of water in a future with climate change. In addition to drought, natural climate phenomena may also affect demand for clean water on South Tarawa; heatwaves, for instance, will increase per capita demand.

---

[1] Projected from the 2015 Population and Housing Census. Land area of South Tarawa is 16 square kilometers.
[2] Ministry of Health and Medical Services. Data on Betio Town Council and Teinainano Urban Council hospitals in South Tarawa. Unpublished.
[3] Current water demand is around 4,500m3/d and is projected to increase to more than 6,000m3/day by 2040.
[4] G. Howard and J. Bartram. 2003. *Domestic Water Quantity, Service, Level and Health*. Geneva: World Health Organization. http://www.who.int/water_sanitation_health/diseases/WSH0302.pdf.

6. **Water supply service levels**. Water supplies in South Tarawa are rationed to 2 hours in every 48 hours, and some areas receive no water at all. Nonrevenue water, which includes physical losses from the network, unbilled authorized consumption, and commercial losses such as theft through illegal connections, has been estimated at 89%.[5] While South Tarawa's transmission main was recently rehabilitated, the distribution network is dilapidated and accounts for the vast majority of physical losses. Domestic customers have not paid for water since 2013, and customers' willingness to pay has been eroded by poor service levels; it will take significant community engagement and advocacy, in addition to better service levels, to restore it.

7. **Hygiene.** Appreciation of the importance of good hygiene is low in South Tarawa, and significantly improved hygiene practices are needed to head off the surge in waterborne diseases as a result of overcrowding and inadequate provision of basic infrastructure. Behavioral change interventions which promote hand washing with soap, household water treatment and safe storage and menstrual hygiene management will continue to play a role in reinforcing key messages and helping to ensure the long-term impacts of WASH interventions are realized.

8. **Options for increasing water supplies**. The Tarawa Water Master Plan 2010–2030[6] and the Tarawa Water and Sanitation Roadmap 2011–2030[7] both concluded that seawater reverse osmosis desalination represents a practical and affordable longer-term option for supplementing the water supplies. A comprehensive desalination feasibility study[8] was conducted in 2012 and endorsed through peer review.[9] Desalination is also considered a climate-adaptive technology, given its ability to improve resilience to water quality degradation and diversify existing water supplies independent of rainfall.[10] The government recently reasserted its interest in solar photovoltaic desalination to augment water supplies.[11] Reducing water losses from the network and improving nonrevenue water management are also key to ensuring the efficiency of water supplies.

9. **Capacity of key institutions**. The Ministry of Infrastructure and Sustainable Energy (MISE) leads national infrastructure development and the provision of public utility services. At the operational level, the main actor is the Public Utilities Board (PUB), a state-owned enterprise which manages power generation, water supply, and sewage disposal in urban South Tarawa. Capacity gaps in key institutions could potentially be accentuated by the implementation of the complex technology (relative to the existing water supply system) that desalination represents and which will require long-term skilled operation and maintenance (O&M) and overall management. The project will formalize the outcomes of sector assessments, which recommended long-term O&M contracts for critical infrastructure. Parallel capacity development activities are included in the project through specialist support to PUB in key result areas and to vocational education and training. The project will also provide project management support to the government.

---

[5] The International Benchmarking Network for Water and Sanitation Utilities. https://www.ib-net.org/ (accessed 12 March 2019).

[6] I. White. 2010. *Tarawa Water Master Plan*. Pacific Region Infrastructure Facility (PRIF). Sydney.

[7] Fraser Thomas Partners. 2012. *Water and Sanitation Roadmap 2011 – 2030*. Volume 1. PRIF. Sydney.

[8] Fraser Thomas Partners. 2012. *South Tarawa Water Supply Options Assessment: Desalination Feasibility Study*. PRIF. Sydney.

[9] Pacific Infrastructure Advisory Centre. 2012. TA-7359-KIR *South Tarawa Water Supply Desalination Feasibility Study: Peer Review Report.* Unpublished.

[10] M. Elliot et al. 2011. *Technologies for climate change adaptation – The water sector*. Roskilde: UNEP Risø Center on Energy, Climate and Sustainable Development.

[11] Government of Kiribati. *Kiribati Development Plan 2016–2019.* Tarawa (undated).

10. **Alignment with strategic priorities**. The project will continue on from the ongoing Asian Development Bank (ADB)-supported South Tarawa Sanitation Improvement Sector Project in contributing to better health and fewer chronic waterborne illnesses among South Tarawa communities.[12] It is included in ADB's country operations business plan, 2018–2020 for 11 Pacific small island countries, and is aligned with ADB's (i) Strategy 2030,[13] (ii) Pacific Approach (2016–2020),[14] and (iii) Water Operational Plan 2011–2020.[15] The project is consistent with the Kiribati 20-Year Vision 2016–2036 (KV20).[16] It is also aligned with the Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management 2014–2023 and the Kiribati Integrated Energy Roadmap 2016–2025.[17]

11. **Value added by ADB assistance**. ADB has strong experience with Kiribati's development of water and other urban infrastructure through its South Tarawa Sanitation Improvement Sector Project, which is on track. As an accredited entity of the GCF, ADB mobilized GCF grant financing for the proposed project. It led the project's preparation, having funded the project preparatory technical assistance and the ongoing project design advance (PDA).[19]ADB's experience in implementing the Ebeye Water Supply and Sanitation Project,[20] which involves desalination technology in another densely populated Pacific island atoll, was applied in the development of the project.[21] ADB is well placed to help capture and disseminate lessons through its investment program and network of partners across the Pacific.

B. Impact and Outcome

12. The project is aligned with the following impact: health and climate change resilience of South Tarawa's population improved.[22] The project will have the following outcome: access of South Tarawa's population to safe, climate-resilient water supplies increased.[22]

C. Outputs

13. **Output 1: Climate resilient and low carbon water supply infrastructure.** This will be achieved by building a desalination plant of 4,000 cubic meters per day, whose energy consumption is offset by a 2,500-kilowatt solar photovoltaic system, and by rehabilitating the water

[12] ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Administration of Grant to the Republic of Kiribati for the South Tarawa Sanitation Improvement Sector Project*. Manila (formerly Tarawa Sanitation Improvement Project). The project involves the rehabilitation of the existing sewer system and saltwater system in Betio, Bairiki and Bikenibeu.

[13] Includes the following operational priorities: (i) making cities more livable; (ii) tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability; and (iii) strengthening governance and institutional capacity.

[14] The Pacific Approach aims to increase the number of people in urban areas enjoying access to reliable water supply services. ADB. 2016. *Pacific Approach, 2016–2020*. Manila.

[15] The Water Operational Plan aims to increase efficiency and productivity in the delivery of water services ADB. 2011. *Water Operational Plan, 2011–2020.* Manila.

[16] The 20-year vision commits the government to extending access to potable water to 100% of households by 2023.

[17] The Kiribati Integrated Energy Roadmap seeks improved energy solutions, increased access to renewable energy, and climate change mitigation, as well as adaptation measures that are sustainable, reliable, and affordable.

[19] ADB. 2017. *South Tarawa Water Supply Project – Project Design Advance*. Manila.

[20] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant to the Government of Kiribati for the Ebeye Water Supply and Sanitation Project.* Manila.

[21] This included providing (i) insight on O&M challenges in remote atolls, (ii) a reference point for cost estimates for desalination in remote atolls, and (iii) an initial understanding of potential market interest in similar projects.

[22] As outlined in the Kiribati Development Plan 2016–2019, increased water and sanitation coverage is to achieve the outcome of "Improved Infrastructure to facilitate economic growth, poverty reduction, trade. Industrialization, health for economic, technological and socio transformation" under Key Priority Area 6: Infrastructure.

[22] The design and monitoring framework is in Appendix 1.

supply distribution network to minimize leakages and add new metered household connections to piped water supplies.[23]

14. **Output 2: Capacity of MISE and PUB to effectively manage water supply infrastructure increased.** This will be delivered through 5-year O&M contracts for the desalination plant and water supply network, which will be attached to the works and funded through the project. Specialist support to PUB in key result areas, and vocational training and mentoring on improved O&M for MISE and PUB staff will be provided.[24]

15. **Output 3: Awareness of WASH and climate change issues is raised.** This will be achieved through the implementation of a 5-year WASH and climate change awareness program.[25]

16. **Output 4: Project implementation is managed efficiently and effectively.** This will be achieved by supporting the government's project management unit (PMU).[26]

D. Summary Cost Estimates and Financing Plan

17. The project is estimated to cost $61.83 million (Table 1).

18. Cost estimates by expenditure category and by financier are detailed in the project administration manual (PAM).[27]

Table 1: Summary Cost Estimates
($ million)

Item	Amount[a]
A. Base Cost[b]	
1. Output 1: Water supply infrastructure is climate resilient and low carbon	34.07
2. Output 2: Water supply infrastructure is effectively managed	12.74
3. Output 3: Awareness of WASH and climate change issues is raised	2.49
4. Output 4: Project implementation is managed efficiently and effectively	2.41
Subtotal (A)	**51.71**
B. Contingencies[c]	
1. Physical contingencies	6.54
2. Price contingencies	3.57
Subtotal (B)	**10.11**
Total (A+B)	**61.83**

WASH = water, sanitation, and hygiene.
[a] Includes taxes and duties of $5.75 million to be financed by the government through exemptions. Numbers may not add precisely due to rounding.
[b] In mid-2018 prices.
[c] Physical contingencies computed at 19% for civil works. Price contingencies computed based on ADB cost escalation factors.
Source: Asian Development Bank estimates.

[23] The desalination plant will help mitigate risks from extreme weather events. Piped water supply connections will include all households headed by women in the project area. The desalination plant will be brought online only after leakages from the water supply network are reduced through rehabilitation.
[24] New technical recruitments to MISE and PUB will target at least 20% women.
[25] The program will include gender-sensitive communication and outreach to improve customers' use and maintenance of the new water supply infrastructure, target problematic behaviors linked to hygiene, and strengthen the institutional enabling environment for WASH.
[26] An evaluation of positive impacts on women's daily lives from reliable access to water will also be undertaken.
[27] Project Administration Manual (accessible from the list of linked documents in Appendix 2). The major expenditure items are the design, build, operate (DBO) contract for the desalination plant and water supply network, the turnkey contract for the solar photovoltaic system, and consulting services for design, project management, and capacity building.

19. The government has requested a grant not exceeding $13.0 million from ADB's Special Funds resources (Asian Development Fund) to help finance the project.

20. The summary financing plan is in Table 2. ADB will finance a proportion of expenditures in relation to the DBO contract, turnkey contract, and consulting services. GCF will provide grant cofinancing on a cost-sharing basis equivalent to $28.63 million in relation to the DBO contract, turnkey contract, and consulting services, to be administered by ADB. The World Bank will provide grant cofinancing equivalent to $12.96 million in relation to the DBO contract, to be administered by the World Bank. The government will provide a cash contribution of $1.49 million, and an in-kind contribution of $5.75 million through exemptions from taxes and duties.

Table 2: Summary Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank		
Special Funds resources (Asian Development Fund grant)[a]	11.39	18.4
Asian Development Fund Disaster Risk Reduction (grant)[b]	1.61	2.6
Green Climate Fund (grant)[c]	28.63	46.3
World Bank (grant)	12.96	21.0
Government of Kiribati[d]	7.24	11.7
Total	**61.83**	**100.0**

[a] Excludes a $2 million project design advance approved in 2017.
[b] The Asian Development Fund Disaster Risk Reduction grant will finance part of the desalination plant.
[c] Administered by the Asian Development Bank. The Green Climate Fund grant will finance a proportion of costs for infrastructure, consulting services, and project management costs. Excludes administration fee, which will be covered separately under the Green Climate Fund's cofinancing arrangement.
[d] Includes taxes and duties of $5.75 million funded through exemptions.
Source: Asian Development Bank estimates.

21. Climate mitigation is estimated to cost $3.4 million and climate adaptation is estimated to cost $28.0 million. ADB and the ADB-administered GCF will finance 100% of mitigation costs and 100% of adaptation costs.[28]

E. Implementation Arrangements

22. As the project includes financing from the World Bank and GCF, universal procurement will apply.[29] Under a project implementation agreement between ADB and World Bank, ADB has been designated as the lead cofinancier and, consequently, all works, goods, and services (including those jointly financed by the World Bank) under the project will be procured by the recipient in accordance with ADB's Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). However, since both ADB and the World Bank will also be jointly financing selected procurement contracts under this project, the respective debarment lists of both ADB and the World Bank will need to be made applicable to such jointly financed contracts under the project. The Agreement for Mutual Enforcement of Debarment Decisions dated 9 April 2010 entered into between ADB and other multilateral development banks (including the World Bank), which enables ADB to cross-debar entities debarred by other multilateral development banks (including the World Bank), is insufficient because only debarments that meet certain conditions—e.g., when the period of debarment is more than 1 year—are eligible for cross-debarment. As such, there are entities debarred by the World Bank that are not cross-debarred by ADB. Accordingly, approval by the

[28] Details are in Climate Change Assessment (accessible from the list of linked documents in Appendix 2).
[29] ADB. 2013. *Blanket Waiver of Member Country Procurement Eligibility Restrictions in Cases of Cofinancing for Operations Financed from Asian Development Fund Resources*. Manila.

ADB Board of Directors is sought to apply the World Bank's debarment list for jointly financed contracts under the project.

23. The PMU under MISE will provide project management and supervision of project activities.[30] Advance contracting will be used for the project. The recipient was advised that approval of advance contracting does not commit ADB to finance the project. The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 28).

Table 3: Implementation Arrangements

Aspects	**Arrangements**		
Implementation period	February 2020–June 2027		
Estimated completion date	30 June 2027		
Estimated grant closing date	31 December 2027		
Management			
(i) Oversight body	NIDSC with secretary to Cabinet (chair), MISE, MFED, MHMS, MELAD, Office of the President.		
(ii) Executing agency	MFED		
(iii) Key implementing agencies	MISE		
(iv) Implementation unit	PMU, 7 staff		
Procurement	ICB	2 contracts	$48.9 million
Consulting services	ICS (individual)	(PMU only) 57 person-months	$1.5 million
	NCS (Individual)	(PMU only) 126 person-months	$0.7 million
	ICS (firm) – PIA	Estimated 232 person-months	$3.1 million
Advance contracting	PDA will finance advance contracting activities including procurement support up to contract award for the DBO and turnkey contracts.		
Disbursement	The ADB and ADB-administered grant proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank; DBO = design, build, operate; ICB = international competitive bidding; ICS = international consultant selection; MELAD = Ministry of Environment, Lands and Agricultural Development; MFED = Ministry of Finance and Economic Development; MHMS = Ministry of Health and Medical Services; MISE = Ministry of Infrastructure and Sustainable Energy; NCS = national consultant selection; NIDSC = National Infrastructure Development Steering Committee; PDA = project design advance; PIA = project implementation assistance, PMU = project management unit.
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

24. The Tarawa Water Master Plan (footnote 6) considered a range of potential sources of water and assessed their capacity to meet present and future demand.[31] Seawater reverse osmosis desalination was the most attractive, provided its economic operating lifetime is at least 10 years.[32] Several subsequent studies similarly recommended that seawater desalination be used to augment potable water supply in South Tarawa.[33] The case for desalination is further

[30] The PMU will include a project director, water supply manager (part-time from PUB), and electricity supply manager (part-time from PUB). The project will fund consultants in the PMU, including project manager, deputy project manager, project accountant, safeguards manager, and social development and gender specialist.

[31] Rainwater harvesting, household water wells, groundwater from groundwater reserves in South Tarawa, potential new groundwater sources in North Tarawa, and nonconventional sources of water were considered.

[32] For the proposed project, an economic operating lifetime of 20 years is expected.

[33] These include (i) Fraser Thomas Partners. 2012. *Water and Sanitation Roadmap 2011–2030 Volume 1*. Pacific Region Infrastructure Facility. Sydney; (ii) Fraser Thomas Partners. 2012. *South Tarawa Water Supply Options Assessment: Desalination Feasibility Study*. Pacific Region Infrastructure Facility. Sydney; (iii) Pacific Infrastructure Advisory Centre. 2012. *South Tarawa Water Supply Options Assessment Desalination Feasibility Study: Peer*

strengthened by the technology's resilience to climate change impacts and to extreme weather events. Water use efficiency is a further adaptation strategy and will be achieved through more effective nonrevenue water management, e.g., by strengthening water supply infrastructure, institutional capacity, and community engagement.

25. Weak local capacity to sustain the sound long-term operation of the desalination plant is counteracted through 5-year outsourced O&M contracts, which will be packaged with the works and delivered through a DBO contract encompassing both the desalination plant and water supply network. The firm responsible for the DBO package will play a critical role in transferring capacity to PUB, and this skills transfer will be incorporated into the employer's requirements.

26. While desalination is an energy-intensive technology compared with conventional water treatment, the project helps offset the energy consumed by the plant and the network by producing renewable energy through solar photovoltaic technology, significantly reducing the overall O&M cost of potable water production.[34] A 2015 study concluded that solar photovoltaic-powered reverse osmosis desalination is the best renewable energy technology option for South Tarawa.[35]

B. Economic and Financial

27. The project is found to be economically viable, with an economic internal rate of return of 9.1% and an economic net present value of $216,683. Substantial cost savings arise from the desalination plant's use of solar photovoltaic energy rather than diesel, and from avoided household-level treatment (i.e., boiling) before the consumption of water. The reduced incidence of waterborne diseases brings down the costs associated with medical care and lost productivity. The sensitivity analysis shows that economic viability worsens across all adverse scenarios, with the project being more sensitive to changes in benefits. A user-pays approach to the water supply component will be developed and adopted, with affordability and willingness-to-pay taken into consideration. Further, the government is expected to realize surplus resources sufficient to fund O&M expenditures not covered by the proposed project, but the risk to the project's financial sustainability is substantial given the high dependence on budgetary support. To help ensure financial sustainability, the government has issued a cabinet decision formally committing it to meet, after project implementation, any additional financing that may be needed for the ongoing operation of the water supply system.

C. Governance

28. The project team assessed project-related governance risks in accordance with ADB's procurement and financial management requirements. The overall risk was assessed to be *moderate* (defined as "likely to occur") and will have low impact if it occurs. Effective mitigation of these risks will take place through (i) the engagement of a qualified and experienced project accountant, who as part of the PMU and based in the Kiribati Fiduciary Services Unit (KFSU) will be responsible for project disbursements, accounting, financial reporting, and record keeping; (ii) an action plan to mitigate the risks, which is detailed in the PAM and will be regularly reviewed and/or updated to ensure that the project responds dynamically to risks during implementation; (iii) inclusion of these tasks in the terms of reference for the project accountant; (iv) financial

Review Report. Unpublished; and (iv) P. Mack. 2016. *Bonriki Inundation Vulnerability Assessment: Summary Report*. Noumea: Secretariat of the Pacific Community.

[34] The solar photovoltaic system will offset 100% of the desalination and water supply network energy demand upon commissioning. Population growth will result in increased water demand and thus increased energy demand.

[35] International Renewable Energy Agency. 2015. Kiribati Integrated Energy Roadmap Renewable Energy. Working draft, September 2015.

oversight of the executing and implementing agencies by the KFSU; and (v) the provision of training to the executing and implementing agencies by ADB's financial management officer during missions, as needed.

29. The existence of the KFSU, which operates under a procedures manual prepared by ADB in 2015, provides confidence that capacity in the government is adequate to handle project procurement requirements in accordance with ADB procedures. The PMU, with support from the firm recruited through the PDA as well as the project implementation assistance firm, will have the requisite expertise to support the execution of DBO contracts and assist MISE in mitigating contract delays. Project management functions such as procurement, contract administration, works supervision, and project accounting will be assisted by the PMU. These measures are satisfactory to mitigate the procurement risks described above.

30. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government. The specific policy requirements and supplementary measures are described in the PAM (footnote 28).

D. Poverty, Social, and Gender

31. The provision of safe and sufficient water supplies in South Tarawa will benefit the people's health by eliminating the current high dependence on contaminated water supplies. The reduction in waterborne diseases will avoid the cost of medical treatment, lost productivity of patients and caregivers, and loss of lives. Other social benefits of improved water supply include improvements in household income levels and security of livelihoods; increased school attendance; and wider social and cultural benefits such as reduced stress levels, better family and community relations, and greater ability to observe religious rites and customs. Women, children, the elderly, and the most disadvantaged households that now bear a disproportionate share of the burden of inadequate water services in South Tarawa will benefit the most.

32. The project is categorized as *effective gender mainstreaming*, and a gender action plan was prepared. Some of the gender targets to be implemented by the project involve establishing new connections in project areas, which will benefit 100% households headed by women; providing quarterly financial literacy training to PUB customers (75% of them women) in 250 communities to improve their ability to pay for water; ensuring that at least 50% of community mobilizers are women; organizing monthly WASH awareness-raising seminars for students, of whom at least 50% are girls; making sure that at least 20% of new recruits to MISE's Water and Sanitation Engineering Unit and PUB's Water Engineering Department are women, and that at least 20% of PUB and MISE staff trained under the project are women; and involving at least 10% women in community work during civil works and/or employing them during O&M.

E. Safeguards

33. The project team screened and assessed the project in compliance with ADB's Safeguard Policy Statement (2009), and plans to mitigate and manage impacts were prepared.[36]

34. **Environment (category B)**. The impacts are largely site-specific, intermittent, and/or temporary (during construction), and mitigation measures can be readily designed and implemented. An environmental and social impact assessment—equivalent to an initial

[36] ADB. Safeguard Categories. https://www.adb.org/site/safeguards/safeguard-categories.

environmental examination and appropriate for the category B project—was undertaken and includes an environmental management plan that will be updated based on the detailed design. The environmental and social impact assessment will form the basis of the application for an environmental license under the country safeguard system. The project management structure includes institutional arrangements to ensure effective implementation of safeguards.

35. **Involuntary resettlement (category B).** Due diligence was undertaken to assess potential involuntary resettlement impacts on all the proposed sites. It found that the proposed water supply infrastructure will not have significant involuntary resettlement impacts; impacts are confined to minor land acquisition and/or lease, affecting assets such as crops and trees of an estimated 33 persons. The desalination plant is proposed to be constructed on land held by the government on a long-term lease, and is not expected to pose any risks during implementation, since the current lease extends until 2040. Government land is generally being sought for the location of the storage tanks, booster pump station, and solar installations, and only if government land is not available will private land be considered. The route for the water supply pipe network is expected to align with existing roads but may require some private land. A resettlement framework was prepared to guide the preparation of necessary safeguard documents for the water supply network upon confirmation of the exact route and a resettlement plan for the desalination plant, booster pumps, and solar installations.[37] Consultations were held with affected persons and included the disclosure of draft safeguard documents; they will continue during project implementation.

36. **Indigenous peoples (category C).** Kiribati's population is a single indigenous ethnic group, and the project beneficiaries are not considered distinct and vulnerable.

37. Since PDA is financing the detailed engineering design for the water supply network, safeguard documents will be updated upon design completion. The project will support positions in the PMU for safeguards, which will enhance the institutional capacity of the borrower to manage environmental and social risks. The PDA and project implementation assistance consultants will support the PMU and provide capacity building and training as core elements of their terms of reference. Pursuant to ADB's Safeguard Policy Statement, ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth in Appendix 5 of ADB's Safeguard Policy Statement. A climate risk and vulnerability assessment was carried out as part of project processing, and climate risks were factored into the infrastructure design. The project will comply with ADB information disclosure and consultation requirements.

F. Summary of Risk Assessment and Risk Management Plan

38. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[38]

[37] Beyond the proposed project sites, potential support via regional TA (ADB. 2018. Implementing a Differentiated Approach to Urban Development in the Pacific. Manila.) on sustainable land use planning and minimizing impacts on vulnerable persons will be discussed with the government.

[38] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
The Public Utilities Board has limited capacity to undertake O&M of key assets.	The project includes a 5-year O&M contract with strong emphasis on capacity transfer.
The government does not allocate sufficient funds for O&M after the project.	The project's inclusion of renewable energy significantly reduces the O&M costs of the desalination plant. Financial sustainability is sought through the support for tariff reforms (through World Bank parallel financing) and activities to raise community awareness of the need to pay for water. The government has committed to long-term subsidies to the water sector, if required.
The implementing agency lacks capacity and expertise in the delivery of complex projects.	(i) Additional procurement expertise engaged through PMU and project design advance; (ii) continued used of KFSU, which has experience in the delivery of high-value ADB-funded projects; and (iii) design of procurement packages in a manner that will allow the most efficient use of the limited resources.
The financial management capacity of the implementing agency and executing agency is limited.	(i) KFSU and the PMU project staff are trained in ADB procedures and in monitoring progress against the design and monitoring framework. (ii) KFSU/PMU will have a qualified and experienced project accountant responsible for preparing project financial statements and familiar with use of accounting software. (iii) Training on ADB's financial reporting and auditing requirements will be provided, as needed.

ADB = Asian Development Bank, KFSU = Kiribati Fiduciary Services Unit, O&M = operation and maintenance, PMU = project management unit.
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

39. The government has assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents.

40. The government has agreed with ADB on certain covenants for the project, which are set forth in the draft grant agreements.

V. RECOMMENDATION

41. I am satisfied that the proposed grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the grant not exceeding $13,000,000 to the Republic of Kiribati from ADB's Special Funds resources (Asian Development Fund) for the South Tarawa Water Supply Project, on terms and conditions that are substantially in accordance with those set forth in the draft grant agreement presented to the Board; and

(ii) the proposal described in para. 22 apply the World Bank's debarment list in addition to ADB's debarment list for jointly financed contracts under the South Tarawa Water Supply Project.

Takehiko Nakao
President

9 August 2019

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with Health[a] and climate change resilience[b] of South Tarawa's population improved			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Access of South Tarawa's population to safe, climate-resilient water supplies increased[c]	a. By 2027, at least 95% of South Tarawa's population (51.5% of them women) has access to safe, climate-resilient water supplies (2019 baseline: <10%)	a. PUB reports	Government does not allocate sufficient funds for O&M after the project.
Outputs 1. Climate resilient and low carbon water supply infrastructure	1a. By 2023, 4,000m3/day desalination capacity is installed (2019 baseline: 0) 1b. By 2024, >95% of households have a piped water connection, including 100% of households headed by women (2017 baseline: 62% of households have a piped water connection).[d] 1c. By 2024, 173km of water supply pipes installed or upgraded (2019 baseline: 0). 1d. By 2022, additional 2500kW solar capacity is installed (2019 baseline: 1630kW capacity).	1a. PUB/DBO reports 1b. PUB reports 1c. PUB reports 1d. PUB reports	Extreme weather events outside of climate change projections occur.
2. Capacity of MISE and PUB to effectively manage water supply infrastructure increased	2a. By 2024, private operator supporting PUB operations is in place and operational (2019 baseline: not applicable) 2b. By 2027, nonrevenue water declines to 25% (2017 baseline: 89%)[d] 2c. By 2027, PUB achieves 95% collection ratio (2017 baseline: 70%)[d] 2d. By 2027, MISE and PUB staff report positive outcomes from exposure to training and/or monitoring programs (2019 baseline: 0. At least 20% of program attendees are women). 2e. At least 20% of new technical recruits to MISE's Water and Sanitation Engineering Unit and PUB's Water Engineering Department are women (2019 Baseline: 9% female staff)[e]	2a. PUB reports 2b. PUB reports 2c. PUB reports 2d. Post-training/mentoring program participant survey responses reported in MISE/PUB reports 2e. MISE reports	Lack of private sector interest or lack of suitable candidates to participate in the project

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
3. Awareness of WASH and climate change issues is raised.	3a. By 2027, >95% of the population (51.5% of them women) is reached directly or indirectly by WASH and climate change awareness programs, which use gender-sensitive materials (2019 baseline: <10%)	3a. PMU reports	
	3b. PUB customers (75% of them women) in 250 communities report improved financial literacy (2019 Baseline: N/A)	3b. PMU reports	
	3c. At least 50% of community mobilizers contracted through the WASH and climate change program are women (2019 Baseline: 0)	3c. PMU reports	
	3d. By 2027, 1,000 people have visited the WASH and climate change visitor education center (2019 baseline: 0)	3d. PMU reports	
4. Project implementation is managed efficiently and effectively	4a. By 2027, PMU meets disbursement targets (2019 baseline: 0)	4a. PMU reports	
	4b. PMU delivers project progress and semiannual gender action plan reports, including sex-disaggregated data (2019 baseline: not applicable)	4b. PMU reports	
	4c. Using a variety of social science techniques, qualitative data is collected over the life of the project in 4–6 project areas to measure positive impacts on women's daily lives resulting from 24/7 access to safe water. These would include baseline, mid and end of project surveys. (2019 Baseline: not applicable)	4c. PMU reports	

Key Activities with Milestones

1. Climate resilient and low carbon water supply infrastructure
1.1 Prepare bid documents for main works packages (Q3 2019).
1.2 Award main works contracts (Q2 2020).
1.3 Commission solar photovoltaic system (Q2 2021).
1.4 Commission desalination plant and water supply network (Q2 2022).
2. Capacity of MISE and PUB to effectively manage water supply infrastructure increased
2.1 Engage project implementation assistance firm (Q1 2020).
2.2 Commence 5-year O&M and capacity support to PUB (Q3 2022).
2.3 Complete 5-year O&M and capacity support to PUB (Q2 2027).
2.4 Complete vocational education program (Q4 2024).

3. Awareness on WASH and climate change issues is raised 3.1 Complete Request for Proposal for WASH program (Q3 2019). 3.2 Award contract to nongovernment organization (Q1 2020). 3.3 Engage Civil Society Organizations in community outreach (Q1 2020). 3.4 Complete WASH program (Q4 2024). **4. Project implementation is managed efficiently and effectively** 4.1 Establish PMU (done in August 2018) 4.2 PMU supports midterm review (Q2 2022). 4.3 PMU supports project completion mission (Q2 2027).
Project Management Activities Establish project management unit (done, August 2018). Mobilize project design advance firm (done, January 2019). Complete bidding documents (Q3 2019). Award contract for main works packages (Q2 2020). Complete all civil works complete (Q2 2023). Monitoring and evaluation and contract management until Q2 2027
Inputs Asian Development Bank: $13.0 million (grant) Government of Kiribati: $7.24 million, including $5.75 million in taxes and duties exemption Green Climate Fund: $28.63 million (grant) World Bank: $12.96 million (grant)
Assumptions for Partner Financing Not applicable

DBO = design, build, operate; MISE = Ministry of Infrastructure and Sustainable Energy; O&M = operation and maintenance; PMU = project management unit; PUB = Public Utilities Board; Q = quarter; WASH = water, sanitation, and hygiene.

[a] As outlined in the Kiribati Development Plan 2016–2019, increased water and sanitation coverage is to achieve the outcome of "Improved Infrastructure to facilitate economic growth, poverty reduction, trade. Industrialization, health for economic, technological and socio transformation" under Key Priority Area 6: Infrastructure.

[b] Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management 2014–2023. In particular, the project is aligned to these major strategies: "Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems; Promoting sound and reliable infrastructure development and land management; Promoting the use of sustainable, renewable sources of energy and energy efficiency; and Delivering appropriate education, training and awareness programs".

[c] "Access" implies sufficient water to meet domestic needs is reliably available close to home, "Safe" water is free from pathogens and elevated levels of toxic chemicals at all times. (http://www.who.int/water_sanitation_health/monitoring/coverage/indicator-6-1-1-safely-managed-drinking-water.pdf).

[d] Based on 2017 data obtained from the International Benchmarking Network for Water and Sanitation Utilities. https://www.ib-net.org/ (accessed 12 March 2019). Baseline will be revisited during implementation upon availability of updated data.

[e] Based on 2018 data. Seven women out of 81 engineering staff from MISE and PUB (six out of the Water and Sanitation Engineering Unit's 34 technical staff, one out of the PUB Water Engineering Department's 47 staff).

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=49453-002-2

1. Grant Agreement: Special Operations
2. Grant Agreement: Externally Financed – Green Climate Fund
3. Sector Assessment (Summary): Water and Other Urban Infrastructure and Services
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Economic and Financial Analysis
8. Country Economic Indicators
9. Summary Poverty Reduction and Social Strategy
10. Risk Assessment and Risk Management Plan
11. Climate Change Assessment
12. Gender Action Plan
13. Environment and Social Impact Assessment
14. Resettlement Plan
15. Resettlement Framework