



Technical Assistance Report

Project Number: 49454-001
Capacity Development Technical Assistance (CDTA)
February 2017

Papua New Guinea: Support for Water and Sanitation Sector Management

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 2 February 2017)

Currency unit	–	kina (K)
K1.00	=	\$0.32
\$1.00	=	K3.17

ABBREVIATIONS

ADB	–	Asian Development Bank
DNPM	–	Department of National Planning and Monitoring
PMU	–	project management unit
PNG	–	Papua New Guinea
TA	–	technical assistance
WASH	–	water, sanitation, and hygiene
WHO	–	World Health Organization
WSS	–	water supply and sanitation

NOTE

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

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CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data		Project Number: 49454-001	
Project Name	Support for Water and Sanitation Sector Management	Department /Division	PARD/PAUS
Country	Papua New Guinea	Executing Agency	Department of National Planning & Rural Dev.
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Water and other urban infrastructure and services	Urban sanitation		0.30
	Urban water supply		0.40
		Total	0.70
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)	Urban environmental improvement		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Urban	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG6		
6. TA Category:	B		
7. Safeguard Categorization	Not Applicable		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		0.70	
Capacity development technical assistance: Technical Assistance Special Fund		0.70	
Cofinancing		0.00	
None		0.00	
Counterpart		0.00	
None		0.00	
Total		0.70	
9. Effective Development Cooperation			
Use of country procurement systems		No	
Use of country public financial management systems		No	

I. INTRODUCTION

1. In Papua New Guinea (PNG), 40% of the population has access to improved drinking water supplies, and just 19% has access to improved sanitation.¹ PNG did not meet the Millennium Development Goals for access to improved water supply and sanitation (WSS) and is not on track to meet its own targets of 70% access by 2030 and 100% access by 2050, as outlined in PNG's Development Strategic Plan, 2010–2030² and Vision 2050.³ The PNG National Water, Sanitation and Hygiene (WASH) Policy recognizes the need for substantially improved access to water and sanitation services and hygiene behaviors, particularly among currently underserved rural and peri-urban settlement areas, and is being implemented by PNG's WASH project management unit (PMU).⁴

2. The government requested Asian Development Bank (ADB) technical assistance (TA) to improve water and sanitation sector management, and to strengthen the government's capacity to implement the WASH Policy.⁵ The proposed TA also forms a precursor to the District Towns Water and Sanitation Project preparatory TA (programmed for 2017) and ensuing loan (programmed for 2018), as reflected in the PNG country operations business plan, 2017–2019.⁶ ADB is also processing a grant in 2017, Water Supply Scheme to Tete Settlement, which directly targets inadequate water supply services to a settlement on the outskirts of the capital, Port Moresby.

3. Reconnaissance missions were fielded in May and October 2016 and government concurrence was obtained for the proposed TA. The design and monitoring framework is in Appendix 1. The TA represents ADB's re-entry into PNG's water sector after the Provincial Towns Water Supply and Sanitation Project was completed in 2008.⁷

II. ISSUES

4. **Urbanization.** PNG is the largest and most populated Pacific nation, with a population of at least 7.5 million.⁸ The urban population of the capital Port Moresby is estimated at about 800,000, of which more than half live in informal settlements.⁹ While the urban growth rate is

¹ World Health Organization/United Nations Children's Fund Joint Monitoring Programme for Water Supply and Sanitation. 2015. Estimates on the Use of Water Sources and Sanitation Facilities: Papua New Guinea. https://www.wssinfo.org/documents/?tx_displaycontroller%5Bregion%5D=&tx_displaycontroller%5Bsearch_word%5D=PAPUA+NEW+GUINEA&tx_displaycontroller%5Btype%5D=country_files.

² Government of PNG, Department of National Planning and Monitoring. 2010. *Papua New Guinea Development Strategic Plan, 2010–2030*. Port Moresby.

³ Government of PNG, National Strategic Plan Taskforce. 2009. *Papua New Guinea Vision 2050*. Port Moresby.

⁴ Government of PNG, Department of National Planning and Monitoring. 2015. *National Water, Sanitation and Hygiene (WASH) Policy, 2015–2030*. Port Moresby.

⁵ The TA is reflected in ADB. 2016. *Country Operations Business Plan: Papua New Guinea, 2017–2019*. Manila. The request for assistance was confirmed during consultations in May and October 2016, and per letter of 5 August 2016 from the secretary of the Department of National Planning and Monitoring. The TA activities and implementation arrangements described in the design and monitoring framework (Appendix 1) were agreed during these consultations. The TA first appeared in the business opportunities section of ADB's website on 28 September 2016.

⁶ ADB. 2016. *Country Operations Business Plan: Papua New Guinea, 2017–2019*. Manila.

⁷ ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Papua New Guinea for the Provincial Towns Water Supply and Sanitation Project*. Manila.

⁸ World Bank, World Bank Open Data. Population, Total. <http://data.worldbank.org/indicator/SP.POP.TOTL> (accessed 18 January 2017).

⁹ Anecdotal evidence from the water utility servicing Port Moresby, Eda Ranu, based on water demand.

around 2%, growth rates in settlements of 5%–8% have been reported.¹⁰ This rapid urbanization has contributed significantly to a growing landless class of people living in informal settlements with little or no access to basic services. These settlements are now an established feature of the urban landscape in Port Moresby.¹¹ Similar trends are found in PNG's other cities—Lae and Mt. Hagen—and most large provincial towns.

5. **Poor service levels.** Utilities struggle to provide acceptable services to existing customers, and are already unable to cope with the pace of urban growth in formalized communities. Challenges are greater for extending services to settlements with insecure land tenure, those in peri-urban areas that may be more remote or outside of formal utility service districts, and those on land that is technically challenging to reach with conventional infrastructure. PNG has approximately two-thirds of the entire population of the 14 Pacific developing member countries, and sector performance in PNG has a huge impact on regional access performance.¹²

6. **Public health.** Limited access to improved WSS services undermines public health and is a main contributing factor to the high infant mortality rate (45 deaths per 1,000 births in 2015).¹³ Waterborne disease, particularly diarrhea, typhoid, and cholera, accounted for 13% of deaths and 14% of malnutrition in 2009, and stunting was attributed to the lack of safe water, basic sanitation, and hygiene practices. Rates of diarrheal diseases in children under 5 years in PNG increased by 25% between 2009 and 2013.¹⁴ Public health challenges are accentuated by large household sizes, which are increasingly found in urban settlements, putting pressure on household facilities and also increasing the likelihood of transmission of infection.¹⁵ Poor public health brings about low labor productivity, forgone employment opportunity, and added health-related expenses among households, which in turn impacts poverty levels and imposes constraints on sustainable development. Poor water and sanitation services impact women and girls in particular, in terms of health, time, school attendance, and security.¹⁶

7. **Policy and governance.** The limited attention afforded to WSS in PNG has resulted in a lack of effective organizational frameworks and coordination in the sector. The PNG National WASH Policy was prepared with World Bank Water and Sanitation Program support, and

¹⁰ A. Schrecongost et al. 2015. *Unsettled: Water and Sanitation in Urban Settlement Communities of the Pacific*. Sydney: Pacific Region Infrastructure Facility.

¹¹ P. Jones. 2012. Managing Urbanisation in Papua New Guinea: Planning for Planning's Sake? *Working Papers Series Two* No. 33. Geelong: Alfred Deakin Research Institute.

¹² World Bank. 2015. *Project Information Document: Concept Stage for Water Supply and Sanitation Development Project (P155087)*. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/EAP/2015/10/12/090224b08313dcd8/1_0/Rendered/PDF/Project0Inform0nt0Project000P155087.pdf.

¹³ United Nations Inter-agency Group for Child Mortality Estimation. 2015. *Levels and Trends in Child Mortality: Report 2015*.

¹⁴ Government of PNG. 2014. *Assessment of Sector Performance, 2009–2013: National Report June 2014*. (National Health Plan, 2011–2020 Sector Performance Annual Review). Port Moresby.

¹⁵ Government of Papua New Guinea. 2010. *National Health Plan, 2011–2020. Volume 1 Policies and Strategies*. Port Moresby.

¹⁶ Women and girls typically carry the burdens of water collection, time spent boiling water for drinking, and caring for sick family members. Poor WASH in schools impacts school attendance, particularly for girls and female teachers. Focus groups report that women are at risk of attack at night when using bush toilets (World Bank. 2014. *Papua New Guinea—Sanitation, Water Supply, and Hygiene in Urban Informal Settlements*: Washington DC. *Social Research Findings and Recommendations*). In PNG, 11.4% of females report that security concerns affect their willingness to walk to fetch water, compared with 4.1% of males (National Statistics Office. 2013. *Household Income and Expenditure Survey 2009–2010*. Port Moresby).

approved by the National Executive Council in 2015. The policy recognizes the need for substantially improved access to water and sanitation services and hygiene behaviors, particularly among currently underserved rural and peri-urban settlement areas. It encompasses the existing targets in the PNG Vision 2050; Development Strategic Plan, 2010–2030; and the corporate plans of state-owned enterprises, among others; and clearly defines the sector targets to be achieved by 2030. The targets include that 95% of the urban population should have access to a safe, convenient, and sustainable water supply, and 85% have access to safe, convenient, and sustainable sanitation. Efforts toward meeting these targets will also place PNG in a more favorable position to meet the Sustainable Development Goals for water and sanitation by 2030, while supporting the wider development agenda, particularly with respect to health and poverty reduction. The WASH Policy is currently being implemented by the existing WASH PMU, which will eventually graduate into the National Water, Sanitation, and Hygiene Authority.¹⁷ The authority will continue the policy implementation via the district development authorities, to which WSS service delivery was decentralized in 2014.¹⁸

8. **Sector funding.** The low priority traditionally given to the WSS sector by the Government of PNG is also reflected by meager funding allocations relative to estimated needs. Estimates suggest that to achieve the government's sector targets, an annual investment of around \$100 million is needed every year until 2030 for capital expenditure (\$30 million for water supply, \$70 million for sanitation) and a further \$20 million per annum for operation and maintenance.¹⁹ The government's (provincial, district, and local government) Services Improvement Program comprises approximately K1.4 billion worth of funding per annum and therefore represents a potential source of financing, although very little has been used to date for water and sanitation.²⁰ The National WASH Policy recognizes the need for increased sector funding, and specifies several mechanisms to achieve increased funding allocation to support WASH infrastructure development, service delivery, and promotion.

9. **Institutional performance.** In urban areas, two state-owned enterprises, Water PNG and Eda Ranu, provide reasonable piped water and sewerage services. Water PNG is responsible for service provision on a commercial basis in district towns outside of Port Moresby. However it has no policy-making influence, and policy coordination with other agencies as well as with customers is limited. The most recent ADB assistance in PNG's water sector, the Provincial Towns Water Supply and Sanitation Project (completed in 2008), was rated *partly successful* in improving PNG's urban water supply and sanitation.²¹ It aimed to increase coverage of water supply and sanitation in capital towns in six provinces and improve the delivery of water supply and sanitation services by building capacity in Water PNG. However, the capacity-building component of the project did not proceed as planned. There continues to be a need to address institutional performance and coordination between key agencies, giving careful consideration to barriers and enablers within the unique institutional context of the PNG water sector.

¹⁷ As per letter dated 26 October 2016 from the PNG WASH PMU coordinator.

¹⁸ Government of PNG. 2014. *District Development Authority Act 2014*. Port Moresby. <http://www.parliament.gov.pg/uploads/acts/14A-40.pdf>

¹⁹ World Bank. 2013. *Water Supply and Sanitation in Papua New Guinea: Turning Finance into Services for the Future*. Washington, DC.

²⁰ Footnote 4, p1.

²¹ ADB. 2010. *Completion Report: Provincial Towns Water Supply and Sanitation Project in Papua New Guinea*. Manila.

III. THE CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

A. Impact and Outcome

10. The impact will be improved performance of the water and sanitation sector in PNG. The outcome will be the strengthened management and delivery of water supply and sanitation infrastructure in PNG. The TA is in line with PNG's Vision 2050; Development Strategic Plan, 2010–2030; Medium-Term Development Plan 2, 2016–2017;²² and National WASH Policy, 2015–2030.

B. Methodology and Key Activities

11. TA support to the WASH PMU from an experienced individual consultant will strengthen sector coordination and leadership and ultimately increase access to improved water and sanitation, particularly in urban settlements, through (i) conducting an assessment of barriers and enablers to the delivery of improved WASH in PNG; (ii) reviewing the institutional structures of the Department of National Planning and Monitoring (DNPM) and Water PNG, making recommendations for institutional strengthening and identifying their respective human resource requirements; (iii) assessing options for increasing WSS access in PNG settlements; and (iv) providing ongoing advice and assistance to the PMU to strengthen peri-urban WSS management and coordination. An experienced water and wastewater advisory firm will (i) assist the DNPM and Water PNG to prepare water safety plans, and (ii) prepare feasibility studies for water supply and sanitation schemes in selected district towns. Draft terms of reference for the individual consultant and the firm providing advisory services are in Appendix 3.

C. Cost and Financing

12. The TA is estimated to cost \$770,000, of which \$700,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-VI). The government will provide counterpart support in the form of counterpart staff available throughout the project duration, office space, access to internet facilities, and other in-kind contributions.

D. Implementation Arrangements

13. Water PNG is the utility responsible for service provision on a commercial basis in district towns outside of Port Moresby and is the proposed implementing agency for the TA, alongside the DNPM. The proposed executing agency is the DNPM. ADB will provide oversight of the TA in close consultation with the DNPM. An individual consultant will be engaged to provide TA support to the WASH PMU for 4 months, commencing in May 2017. A consultant firm will be engaged separately to deliver specified outputs over a period of 36 months, from May 2017 to April 2020.²³ The individual consultant and firm will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Fund disbursements will be made in accordance with the *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

²² Government of PNG, Department of National Planning and Monitoring. 2015. *Papua New Guinea Medium-Term Development Plan 2, 2016–2017*. Port Moresby.

²³ The consultant firm will be engaged using output-based and/or lump-sum contracts in line with ADB. 2014. *Midterm Review of Strategy 2020: Action Plan*. Manila.

14. While the TA will aim to develop context-specific solutions to the unique challenges PNG presents in terms of providing effective WSS services to informal settlements, successful approaches identified will find relevance both in the Pacific context and in the wider development community. ADB (in partnership with the DNPM and the WASH PMU) will identify good practices and transferable lessons from the proposed TA that deliver outcomes beyond expectation. ADB's Pacific Department will work in close collaboration with ADB's Water Sector Group to disseminate appropriate knowledge products within ADB, across ADB developing member countries (particularly in the Pacific region), and more widely among international development partners. Where applicable, the Pacific Water and Wastewater Association and Pacific Regional Infrastructure Facility Water and Sanitation Sector Working Group may be mobilized to assist in this process.

IV. THE PRESIDENT'S DECISION

15. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$700,000 on a grant basis to Papua New Guinea for Support for Water and Sanitation Sector Management, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Impact the TA is Aligned with Performance of the water and sanitation sector in PNG is improved. ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Management and delivery of WSS infrastructure in PNG is strengthened.	By December 2017, 44% of the population has access to safe water supply and 26% to sanitation facilities, of whom half are women. (2015 baseline: 40% access to improved water supply, 19% to improved sanitation; half of PNG's population are female) ^b	JMP, other sources	Government commitment to improved delivery of WSS weakens.
Outputs 1. Water PNG and DNPM capacity to utilize and make operational technical planning, institutional, and management tools is strengthened. 2. Readiness of the Government of PNG to implement projects aimed at improving WSS access in settlements and district towns is improved.	1a. Assessment of barriers and enablers to the delivery of improved WASH in PNG has been shared with key institutions by September 2017. (2016 baseline: 0) 1b. Recommendations for institutional strengthening and human resource requirements of Water PNG and DNPM, including consideration of gender elements, are being implemented by December 2017. (2016 baseline: 0) 1c. Water safety plans are available by August 2017. (2016 baseline: 0) 2a. Options assessment report for increasing WSS in settlements delivered by September 2017. (2016 baseline: 0) 2b. Feasibility studies on increasing access to WSS in three district towns, including consideration of gender elements, delivered by December 2017. (2016 baseline: 0)	1a. Assessment report on barriers and enablers 1b. Water PNG and DNPM institutional reports 1c. Water safety plans 2a. Options assessment report for increasing WSS access in settlements 2b. Feasibility studies on increasing WSS access	Water PNG and DNPM technical and project managerial resources are not retained. Fraud and corruption risks affect the realization of TA outputs.

Key Activities with Milestones

Output 1: Water PNG and DNPM capacity to utilize and make operational technical planning, institutional, and management tools is strengthened.

1.1 Following studies conducted on key institutions, an assessment of the barriers and enablers for improved WASH in PNG, which gives consideration to the role of women as decision makers with respect to WASH, has been carried out by September 2017.

1.2 Recommendations for institutional strengthening and human resource requirements of Water PNG and DNPM, including consideration of gender issues, are prepared by September 2017 and implemented by December 2017.

1.3 A workshop on key outcomes from peri-urban TA support to WASH PMU is conducted by September 2017.

1.4 Following consultation with key stakeholders, water safety plans are prepared by August 2017.

Output 2: Readiness of the Government of PNG to implement projects aimed at improving WSS access in settlements and district towns is improved.

2.1 Surveys on three settlements in Port Moresby are conducted by June 2017.

2.2. An options assessment report for increasing access to WSS in settlements is delivered by September 2017.

2.3 Survey on WSS in district town 1 is conducted by July 2017.

2.4 Feasibility study on increased access to WSS in district town 1 is conducted by August 2017.

2.5 Survey on WSS in district town 2 is conducted by September 2017.

2.6 Feasibility study on increased access to WSS in district town 2 is conducted by October 2017.

2.7 Survey on WSS in district town 3 is conducted by November 2017.

2.8 Feasibility study on increased access to WSS in district town 3 is conducted by December 2017.

Inputs

ADB: \$700,000

Note: The government will provide counterpart support in the form of counterpart staff available throughout the project duration, office space, access to internet facilities, and other in-kind contributions.

Assumptions for Partner Financing

Not Applicable

ADB = Asian Development Bank, DNPM = Department of National Planning and Monitoring, JMP = Joint Monitoring Programme for Water Supply and Sanitation, PNG = Papua New Guinea, TA = technical assistance, WASH = water sanitation and hygiene, WSS = water supply and sanitation.

^a Government of PNG, DNPM. 2015. *National Water, Sanitation and Hygiene (WASH) Policy, 2015–2030*. Port Moresby; Government of PNG. 2015. *Papua New Guinea Medium-Term Development Plan 2, 2016–2017*. Port Moresby; Government of PNG, National Strategic Plan Taskforce. 2009. *Papua New Guinea Vision 2050*. Port Moresby; and Government of PNG, DNPM. 2010. *Papua New Guinea Development Strategic Plan, 2010–2030*. Port Moresby.

^b Redefinition of the targets for water and sanitation following transition from Millennium Development Goals (“Improved” water supplies and sanitation) to Sustainable Development Goals (“Safe” water supplies and “adequate” sanitation).

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

(\$'000)

Item	Amount
Asian Development Bank^a	
1. Consultants	
a. Remuneration and per diem ^b	626.0
b. International and local travel	5.0
c. Reports and communications	10.0
2. Surveys ^c	8.0
3. Training, seminars, and conferences	
a. Training program	5.0
b. Participant attendance fee	5.0
4. Representative for contract negotiations	6.0
5. Contingencies	35.0
Total	700.0

Note: The technical assistance (TA) is estimated to cost \$770,000, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of counterpart staff available throughout the project duration, office space, access to internet facilities, and other in-kind contributions. The value of government contribution is estimated to account for 9.1% of the total TA cost.

^a Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-VI).

^b Includes \$514,000 for consultant firm outputs (lump sum), which encompasses all costs incurred by the firm to deliver the TA outputs, including travel expenses.

^c Surveys conducted on three peri-urban settlements in Port Moresby in order to prepare options assessment.

Source: Asian Development Bank

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Scope of Work (Individual Consultant)

1. The individual consultant—a peri-urban water, sanitation, and hygiene (WASH) advisor—will provide support to the WASH project management unit (PMU) to strengthen sector coordination and leadership and ultimately increase access to improved water and sanitation, particularly in urban settlements, in Papua New Guinea (PNG). The advisor will be assigned to the WASH PMU in Port Moresby for 4 months full time, from 1 May 2017 to 31 August 2017.

2. Specific tasks and responsibilities of the peri-urban WASH advisor are as follows:
- (i) Prepare a work plan in consultation with the WASH PMU and Water PNG. Incorporate comments and suggestions into the final work plan and detail any design changes to the scope as required.
 - (ii) Prepare an assessment and report on the enablers and barriers to the delivery of improved WASH in PNG. Give consideration to the role of women as decision makers with respect to WASH.
 - (iii) For Water PNG and the relevant water supply and sanitation (WSS) sector units within the Department of National Planning and Monitoring (DNPM), review institutional arrangements and assess personnel and project management capacity. Prepare a working paper that provides recommendations to strengthen each institution and sustainably develop their respective human resources. Ensure gender issues are assessed and addressed in the working paper.
 - (iv) Prepare an assessment of the procurement capacity of Water PNG and the relevant units within the DNPM following procurement capacity assessment procedures of the Asian Development Bank (ADB).
 - (v) Conduct a literature review on WASH in informal settlements in PNG and elsewhere in Pacific developing member countries. Select three informal settlements within Port Moresby and conduct field surveys to capture key data. Identify options to increase access to WSS in PNG's urban informal settlements, and obtain feedback on the options from key stakeholder groups. Identify and recommend priority investments for inclusion in an ensuing investment project for consideration by the DNPM.
 - (vi) Mentor and coach WASH PMU personnel to strengthen capacity in peri-urban WSS management and coordination.
 - (vii) Provide support to the WASH PMU in the coordination of parallel ADB activities in the WSS sector.
 - (viii) Conduct a workshop for Water PNG, Eda Ranu, relevant WSS sector units within the DNPM, and other stakeholders relevant to peri-urban WSS on the outcomes and recommendations developed during the technical assistance (TA).

1. Required Qualifications, Experience, and Attributes

3. The consultant will have at least a bachelor's degree in a relevant discipline, and 15 years' experience with water utilities or in WASH service provision encompassing peri-urban areas. The last 5 years must be in a senior leadership capacity, including demonstrated experience in the development of WASH policy and provision of strategic policy advice at a senior management level.

2. Outputs and Reporting Requirements

4. In addition to the tasks and outputs described in para. 2, the peri-urban WASH advisor will produce monthly progress reports and other outputs as required from time to time, as mandated by the WASH PMU. The advisor will report to the coordinator of the WASH PMU.

B. Scope of Work (Consulting Firm)

5. The water and wastewater advisory firm will assist the DNPM and Water PNG to strengthen management of the WSS sector in PNG.

6. These terms of reference are output based as opposed to traditional input-based terms of reference. The specific outputs for the consultant firm are described in para. 17. The firm is requested to focus on proposing how to produce and deliver the required outputs of high quality rather than on proposing quality inputs for the consulting service. It is estimated that the firm will be engaged from 1 May 2017 to 31 April 2018.

1. Outputs and Deliverables

7. **Work plan.** In consultation with key stakeholders and with the guidance of the DNPM, the firm will prepare its TA work plan for review by key stakeholders, incorporate comments and suggestions into the final work plan, and detail any design changes required in the firm's TA scope.

8. **Water safety plans.** In consultation with key stakeholders, including the DNPM; the Conservation, Environment, and Protection Authority; and the Ministry of Health, the firm will prepare one or more water safety plans in accordance with the World Health Organization (WHO) Guidelines for Drinking-Water Quality¹ and WHO's Water Safety Plan Manual (2009).² The scope of the water safety plans prepared will be decided in discussion with the DNPM. The firm will support awareness-raising activities associated with the water safety plans in order to facilitate the plans' adoption in the policy and operations of key stakeholders.

9. **Preparation of feasibility studies for water supply and sanitation schemes in three selected district towns.** District towns will be selected in discussion with the DNPM and Water PNG. Detailed tasks will include the following:

- (i) Survey the location, attributes, and condition of water supply and sanitation assets. Construct a Geographic Information Systems (GIS) database of WSS assets in the selected district towns, and include any existing blueprints or data if available, in addition to new data. Prepare an asset condition report including plans showing the location, routing, and attributes (type, dimensions, material, condition, etc.) of the assets.
- (ii) For the selected district towns, (a) prepare demand forecasts for 2017–2030 and assess the security of water resources currently available, taking into account predicted climate change impacts; (b) identify improvements to the Water PNG water supply systems required to efficiently deliver potable water at the agreed level of service under the existing and future demand scenarios, and ensure that consideration is given to social, gender, resettlement, and

¹ WHO. 2011. *Guidelines for Drinking-Water Quality*. 4th ed. Geneva.

² J. Bartram et al. 2009. *Water Safety Plan Manual: Step-by-Step Risk Management for Drinking Water Suppliers*. Geneva: WHO.

- environmental issues; (c) provide preliminary cost assessments on the proposed improvements; and (d) provide a basic concept for a model in which district development authorities take over the operation and maintenance of the improved water supply systems (including billing and collection), and conduct a basic assessment of water tariffs to be applied.
- (iii) For the selected district towns, (a) review appropriate options for sanitation services, giving consideration to community acceptance of various technologies, gender, and cultural considerations, ease and cost of operation and maintenance, technical constraints, capital cost of each option, availability of materials, and accessibility for vulnerable persons and children; (b) identify improvements to sanitation and sewerage systems required to effectively and efficiently collect, treat, and dispose of sewage at the agreed level of service under the existing and future demand scenarios; (c) provide preliminary cost assessments on the proposed improvements; and (d) conduct a basic assessment of sewerage tariffs to be applied in the case of a communal tank collection system in the selected district towns.

10. **Monthly reports.** The firm should prepare and submit monthly progress reports within 1 week of the end of each month for the duration of the TA, and other outputs as required from time to time, as mandated by the WASH PMU.

11. **Final report.** The firm should prepare a draft final report for review by key stakeholders. The final report should include a proposed project implementation schedule for any ensuing investments. Following the review of the draft, the firm will incorporate comments and suggestions into the final report.

2. Required Qualifications, Experience, and Attributes

12. Proposing entities will determine the number and the nature of experts they will require to achieve the objectives of the contract, in accordance with their proposed approach and methodology. However, ADB requires a minimum of one key expert (the team leader and project management specialist, 1 person-month), who will have a bachelor's degree in engineering or project management and at least 20 years' water utility experience with at least the last 10 in a senior leadership capacity, including demonstrated experience in the development of water supply and sanitation schemes. Knowledge of ADB procurement and reporting procedures and developing nation experience is essential. The team leader and project management specialist will be responsible for ensuring satisfactory performance of the water and wastewater advisory firm consultants and will report to the director of the WASH PMU.

13. In addition to the above required key expert, the proposing entities should also include in their technical proposal, in the personnel work plan, and in their financial proposal, all other non-key experts required in accordance with their proposed approach and methodology. The proposing entity must also determine and indicate the number of person-months for which each key or non-key expert will be required.

14. All experts engaged under the contract, whether key or non-key experts, must be citizens of ADB eligible countries.

15. The water and wastewater advisory firm must have demonstrated experience in the following areas: (i) contract management of water supply and sanitation projects, (ii) planning and design of water supply and sanitation schemes, (iii) quality assurance and quality control

systems, (iv) environmental requirements for civil infrastructure development, (v) organizational change management and capacity building in water utilities, (vi) electronic project scheduling, (vii) project financing for water supply schemes, and (viii) health and safety in the workplace.

3. Preparation of Proposal

16. Only one curriculum vitae must be submitted for each key and non-key expert included in the proposal. Only the curricula vitae of key experts will be scored as part of the technical evaluation of proposals. The curricula vitae of non-key experts will not be scored. However, ADB will review and individually approve or reject each curriculum vitae for each non-key expert position in the proposal.

4. Outputs and Reporting Requirements

17. The outputs and tentative payment schedule for the water and wastewater advisory firm are provided in Table A3. Month numbers reflected are relative to TA commencement. Tentative milestone payments are relative to the total contract amount.

Table A3: Outputs and Tentative Payment Schedule for Water and Wastewater Advisory Firm

Output	Target Date Due (month)	Tentative Milestone Payment^a
Work plan	1	0.02
Monthly reports (8 at 0.004 each) ^a	1-8 ^b	0.03
Water safety plans (draft)	2	0.05
Water safety plans (final)	3	0.04
Feasibility study on district town 1 (draft)	3	0.16
Feasibility study on district town 1 (final)	4	0.10
Feasibility study on district town 2 (draft)	5	0.16
Feasibility study on district town 2 (final)	6	0.10
Feasibility study on district town 3 (draft)	7	0.16
Feasibility study on district town 3 (final)	8	0.10
Draft technical assistance report	10	0.06
Final technical assistance report	12	0.04
Total		1.00^c

^a As a proportion of total contract sum.

^b To be delivered within 1 week of the end of each month, during the first 8 months when major outputs are being delivered. Tentative milestone payment reflects total payment for 8 monthly reports.

^c Individual milestone payments may not add to 1.00 due to rounding.

Source: Asian Development Bank.