Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD1746

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 51.0 MILLION
(US$70 MILLION EQUIVALENT)

TO THE

INDEPENDENT STATE OF PAPUA NEW GUINEA

FOR A

WATER SUPPLY AND SANITATION DEVELOPMENT PROJECT

January 17, 2017

Water Global Practice
EAST ASIA AND PACIFIC

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2016)

Currency Unit	=	PGK
PGK3.1696	=	US$1
US$1.37385	=	SDR 1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CERIP	Contingent Emergency Response Implementation Plan
CPS	Country Partnership Strategy
CSGIM	Community Schemes Grant Implementation Manual
CSO	Community Service Obligation
CSTB	Central Supply & Tenders Board
DDA	District Development Authority
DNPM	Department of National Planning and Monitoring
DSP	Development Strategic Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
EU	European Union
FM	Financial Management
GDP	Gross Domestic Product
GESI	Gender Equality and Social Inclusion
GRS	Grievance Redress Service
HDI	Human Development Index
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFR	Interim financial report
IRR	Internal rate of return
JMP	Joint Monitoring Program
KCH	Kumul Consolidated Holdings
KPI	Key performance indicator
LLG	Lower Level Government
LNG	Liquefied Natural Gas
MDG	Millennium Development Goal
MIS	Management Information System
MP	Member of Parliament
MTSP	Medium Term Development Plan
NCD	National Capital District

NEC	National Executive Council
NGO	Non-Governmental Organization
NPV	Net present value
NRW	Non-water revenue
NWSHA	National Water, Sanitation and Hygiene Authority
O&M	Operations and maintenance
OP	Operational Policy
PCR	Physical cultural resources
PFMA	Public Financial Management Act
PGAS	Papua New Guinea Government Accounting System
PIM	Project Implementation Manual
PIP	Public Investment Projects
PMU-WPNG	Project Management Unit of Water PNG
PNG	Papua New Guinea
SDA	Service Delivery Assessment
SOE	State-owned Enterprise
SORT	Systematic Operations Risk- Rating Tool
StaRS	National Strategy for Responsible Sustainable Development
STEP	Systematic Tracking of Exchanges in Procurement
TOR	Terms of Reference
UN	United Nations
UNICEF	United Nations Children's Fund
WaSH	Water, Sanitation and Hygiene
WaSH PMU	WaSH Project Management Unit formed by DNPM
WSP	Water and Sanitation Program
WSS	Water Supply and Sanitation

Regional Vice President:	Victoria Kwakwa
Country Director:	Michel Kerf
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	Sudipto Sarkar
Task Team Leaders:	Fook Chuan Eng / Edkarl M. Galing

PAPUA NEW GUINEA
Water Supply and Sanitation Development Project

TABLE OF CONTENTS

PAD DATA SHEET

Papua New Guinea

Water Supply and Sanitation Development Project (P155087)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

0000009391

Report No.: PAD1746

Basic Information		
Project ID P155087	EA Category B - Partial Assessment	Team Leader(s) Fook Chuan Eng,Edkarl M. Galing
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]	
Project Implementation Start Date 09-Feb-2017	Project Implementation End Date 31-Aug-2022	
Expected Effectiveness Date 09-Jun-2017	Expected Closing Date 28-Feb-2023	
Joint IFC No		

Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Sudipto Sarkar	Guang Zhe Chen	Michel Kerf	Victoria Kwakwa

Borrower: Independent State of Papua New Guinea			
Responsible Agency: Department of National Planning and Monitoring			
Contact:	Hakaua Harry	Title:	Secretary
Telephone No.:	6753288324	Email:	hakaua_harry@planning.gov.pg
Responsible Agency: Water PNG			
Contact:	Raka Taviri	Title:	Chief Executive & Managing Director
Telephone No.:	6753031600	Email:	rtaviri@waterpng.com.pg

Project Financing Data(in USD Million)		
[ ] Loan	[ ] IDA Grant	[ ] Guarantee

[X] Credit	[ ] Grant	[ ] Other	
Total Project Cost:	77.30	Total Bank Financing:	70.00
Financing Gap:	0.00		

Financing Source	**Amount**
BORROWER/RECIPIENT	7.30
International Development Association (IDA)	70.00
Local Sources of Borrowing Country	0.00
Total	77.30

Expected Disbursements (in USD Million)

Fiscal Year	2017	2018	2019	2020	2021	2022	2023	0000	0000	0000
Annual	2.90	9.60	12.60	14.60	14.00	10.60	5.70	0.00	0.00	0.00
Cumulative	2.90	12.50	25.10	39.70	53.70	64.30	70.00	0.00	0.00	0.00

Institutional Data

Practice Area (Lead)

Water

Contributing Practice Areas

Proposed Development Objective(s)

The Project Development Objective (PDO) is to support the development and strengthening of the planning and implementation capacity of water sector institutions, and to increase access to water supply services in selected urban towns and rural districts.

Components

Component Name	**Cost (USD Millions)**
Component 1: Institutional structures for the implementation of the National WaSH Policy	5.70
Component 2: Rural and Peri-urban Water and Sanitation	15.15
Component 3: Urban Water and Sanitation	56.45
Component 4: Contingent Emergency Response	0.00

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	**Rating**
1. Political and Governance	High
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate

4. Technical Design of Project or Program	Low
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Low
9. Other	
OVERALL	Substantial

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10	**X**	
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
WaSH PMU Project Implementation Manual		07-Oct-2017	

Description of Covenant

Not later than one hundred and twenty (120) days after the Effective Date, the Recipient shall collate and adopt a WaSH PMU Project Implementation Manual, in form and substance satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
PMU-WPNG Project Implementation Manual		07-Oct-2017	

Description of Covenant

Not later than one hundred and twenty (120) days after the Effective Date, the Project Implementing Entity shall collate and adopt a PMU-WPNG Project Implementation Manual, in form and substance satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
Training and Capacity Building Plans	**X**		Yearly

Description of Covenant

Not later than sixty (60) days after the Effective Date, the Recipient and Project Implementing Entity shall prepare and furnish to the Association for its approval, a training and capacity building plan for Parts 1 and 2, and Part 3 of the Project, respectively, for the first year of the Project, and thereafter shall prepare such plans from time to time, but not later than January 31 of each year, and shall ensure that the Project is implemented in accordance with the approved training and capacity building plans.

Name	Recurrent	Due Date	Frequency
Mid-Term Review Report		08-Nov-2019	

Description of Covenant

The Recipient, through the WaSH PMU, and with the support from the Project Implementing Entity, respectively, shall prepare and furnish to the Association, not later than thirty (30) months after the Effective Date, a report on the progress achieved in the carrying out of the Project during the period preceding the date of said report and setting out the measures recommended to ensure the efficient carrying out of the Project and the achievement of the objectives thereof during the period following such date.

Conditions

Source Of Fund	Name	Type
IDA	Financing Agreement Article V, para. 5.02	Effectiveness

Description of Condition

The Subsidiary Agreement has been duly authorized or ratified by the Recipient and the Project Implementing Entity and is legally binding upon the Recipient and the Project Implementing Entity in accordance with its terms.

Source Of Fund	Name	Type
IDA	Financing Agreement, Schedule 2, Section IV.B, para. 1(a)	Disbursement

Description of Condition

No withdrawal shall be made for payments made prior to the date of this Agreement, except that withdrawals up to an aggregate amount not to exceed three hundred and fifty thousand Special Drawing Rights (SDR 350,000) may be made for payments made prior to this date but on or after July 1, 2016, for Eligible Expenditures under Categories (1) and (2).

Source Of Fund	Name	Type

IDA	Financing Agreement, Schedule 2, Section IV.B, para. 1(b)	Disbursement

Description of Condition

No withdrawal shall be made under Category (3) unless the Association has received the Community Schemes Grant Implementation Manual in form and substance satisfactory to the Association.

Source Of Fund	Name	Type
IDA	Financing Agreement, Schedule 2, Section IV.B, para. 1(c)	Disbursement

Description of Condition

No withdrawal shall be made for Emergency Expenditures under Category (6), unless and until the Association is satisfied, and has notified the Recipient of its satisfaction, that all conditions have been met to trigger Component 4: Contingent Emergency Response.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Fook Chuan Eng	Team Leader (ADM Responsible)	Lead Water and Sanitation Specialist	Water and Sanitation	GWA02
Edkarl M. Galing	Team Leader	Water & Sanitation Specialist	Water and Sanitation	GWA02
Eric Leonard Blackburn	Procurement Specialist (ADM Responsible)	Procurement Specialist	Procurement	GGO08
Cristiano Costa e Silva Nunes	Procurement Specialist	Senior Procurement Specialist	Procurement	GGO08
Robert J. Gilfoyle	Financial Management Specialist	Sr Financial Management Specialist	Financial Management	GGO20
Carmenchu D. Austriaco	Team Member	Finance Officer	Disbursement	WFALN
Chau-Ching Shen	Team Member	Senior Finance Officer	Disbursement	WFALN
Christophe Prevost	Peer Reviewer	Sr Water & Sanitation Spec.	Water and Sanitation	GWA04
Danielle Malek Roosa	Counsel	Senior Counsel	Legal	LEGES
Demilour Reyes Ignacio	Team Member	Senior Executive Assistant	Team Assistance	GWADR
Duangrat Laohapakakul	Counsel	Senior Counsel	Legal	LEGES
Joseph A. Gadek	Team Member	Consultant	Engineering	GSU13
Loren Jayne Atkins	Counsel	Associate Counsel	Legal	LEGES
Marilyn Tolosa Martinez	Team Member	Consultant	Economics	GSU12

Nicholas John Valentine	Safeguards Specialist	Consultant	Environment	GSU02
Pierre Francois-Xavier Boulenger	Peer Reviewer	Senior Water Supply and Sanitation Specialist	Water and Sanitation	GWA07
Raghava Neti	Peer Reviewer	Senior Infrastructure Specialist	Water and Sanitation	GWA06
Ross James Butler	Safeguards Specialist	Senior Social Development Specialist	Social	GSU02
Summerville Kave	Team Member	Program Assistant	Team Assistance	EACGF
Trevor Nott	Team Member	Consultant	Sector Policy	GWA02

Extended Team

Name	Title	Office Phone	Location

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required ? Consultants will be required

I. STRATEGIC CONTEXT

A. Country Context

1. **Eighty seven percent of Papua New Guinea's (PNG's) seven million people live in rural areas**. Almost all the rest live in small urban centers, the majority of which have a population of well below 30,000 people. Only Port Moresby and Lae have sizable populations at about 365,000 and 88,000 respectively[1]. Average national population density is low at about 14 per km^2. PNG's population is characterized by a very diverse number of social groups, with strong local and clan-based affinities and allegiances. There are over 800 distinct languages.

2. **Despite substantial natural wealth and recent positive economic performance, PNG's human development indicators remain amongst the lowest in the world.** The economy is dominated by: (i) the agricultural, forestry and fishing sector, where most of the population are informally engaged in, and (ii) the minerals and energy extraction sector which accounts for the majority of export earnings. Overall, there has been sustained positive economic performance over the past decade. However, PNG's Human Development Index (HDI) ranking is 157, the lowest ranked in the Pacific region along with the Solomon Islands. The poverty rate in 2010 is 39.9 percent, with poverty more prevalent in rural areas (42%) vis-à-vis urban centers (29%). The level of consumption inequality, measured by the Gini coefficient, is 0.4 in 2010. PNG has fallen short of virtually all its Millennium Development Goals (MDGs). PNG's lack of infrastructure facilities (especially in rural areas), coupled with a prevailing scenario of weak institutions, transparency and accountability, are major constraints to economic development and delivery of basic services to the population.

3. **The long term development strategy of PNG envisions transforming the country and its society towards a top 50 ranking in the HDI index by 2050**. Vision 2050 (launched in 2009) established the seven pillars of strategic planning, systems and institutions, human development, wealth creation, security and international relations, environment and climate change, and partnerships with churches on which to build this vision. The Vision 2050 focus areas were translated into various economic policies, public policies and sector interventions in the PNG Development Strategic Plan (DSP) 2010 – 2030. At the heart of the DSP 2010 – 2030 is the aim of achieving a prosperous middle income country status by 2030.

4. **Recent reviews of the optimum path towards achieving the objectives and goals of Vision 2050 and DSP 2010 – 2030 have emphasized the need for deeper strategic planning and for responsible and sustainable development trajectories**. The National Strategy for Responsible Sustainable Development (StaRS) 2013 charts out a new development roadmap towards the goals of Vision 2050 and DSP 2010 – 2030. StaRS prescribes a growth strategy based around the responsible management and use of PNG's non-renewable and renewable natural resources for the benefit of a sustainable and stable population size. StaRS recognizes water resources as a key renewable natural resource and strategic asset of the country.

5. **The rolling Medium Term Development Plans (MTDPs) provide investment plans aligned to the StaRS, DSP 2010 – 2030 and Vision 2050**. The MTDP 2016 – 2017 (MTDP 2)

[1] 2011 National Census, data for National Capital District and Lae Urban respectively.

includes a goal of increasing access to reliable and affordable water and sanitation services and to improve hygiene behavior through, among others, the implementation of the recently approved National Water, Sanitation and Hygiene (WaSH) Policy.

B. Sectoral and Institutional Context

6. **PNG has the lowest water and sanitation access indicators among the 15 developing Pacific Island nations**. With approximately two-thirds of the entire population of these 15 nations, this has a huge impact on regional access performance. The 2015 update of the UN's Joint Monitoring Program (JMP) estimates access to safe drinking water and improved sanitation in PNG at 40% and 19% respectively. In the two decades since 1990, the increase in access to safe drinking water has been very small (access in 1990 was 34%), while improved sanitation coverage recorded a drop (access in 1990 was 20%). PNG has missed its MDG targets for water and sanitation, and is not on track to meet its own national development targets of 70% access by 2030, and 100% access by 2050.

7. **Climate and disaster risk screening points to increasing hazards from extreme precipitation, flooding and drought in the future, potentially impacting the security and sustainability of water supply in PNG**. Predictions of rainfall decreases or increases from -2.7% to +25.8% in the northern Pacific, and -14% to +14.6% in the southern Pacific, could worsen floods or droughts. Recent evidence and model simulations point to more frequent occurrences of El Nino weather patterns, bringing an increase in drought conditions in this region. The National Disaster Center has estimated the 2015/16 El Nino to have affected up to 2.4 million people in PNG, with drought and frost impacting agriculture, leading to reduced health and nutrition statuses and other socio-economic losses e.g., from reduced crop harvest.

8. **There are significant variations in the access rate, and the status and pace of development, among the rural water supply, rural sanitation, urban water supply and urban sanitation subsectors**. The only subsector with increasing access since 1990 is the rural water subsector. Rural sanitation, urban water and urban sanitation access percentages have either stagnated or decreased since 1990, pointing to an inability to cope with population growth (about 2.8% per year). Rural access to improved water and sanitation stood at 33% and 13% respectively. The corresponding access figures for urban areas are 88% and 56% respectively. But even then, only 21 of the approximately 90 main urban and district centers are served by Eda Ranu and Water PNG, the two State-owned Enterprises (SOEs) responsible for service provision in the National Capital District (NCD) and other urban areas respectively. A handful of urban centers have some service provision provided by their subnational governments.

9. **The current service provision arrangements, where they exist, are likely to change with the implementation of the new District Development Authority (DDA) Act (2014)**. Under the Act, a DDA will be created at every district. Among others, it will control budget allocation priorities and be responsible for service delivery in districts. DDAs are new structures and it may take some time before the outcome and/or success of this new arrangement can be gauged. The implementation of programs including water supply and sanitation (WSS) programs in districts may be negatively impacted during this period of institutional transition.

10. **Financing requirements for the sector is very large**. A high level Service Delivery Assessment study[2] conducted in 2013 estimated that US$2 billion of investments will be required to reach the Government's 2030 WSS targets. Additionally, about US$20 million per year will be required to finance the operation and maintenance (O&M) of current and future infrastructure. Financing requirements notwithstanding, the planning and decision making mechanisms for allocating financial resources to the sector by central and subnational governments are not entirely clear. Budget monitoring and reporting is incomplete – the national budgeting system does not fully distinguish water and sanitation budgets. Private resources extraction companies and non-state actors (faith-based groups, and domestic and international NGOs) have been important for supporting water supply developments in rural areas. But these have been limited to specific geographic areas, are dependent on unreliable funding streams and have limited O&M. Additionally, their contribution are off government budget and may not be reported.

11. **Where public financing of WSS infrastructure occurs, there are no overall sector level coordination or planning**. Financing for WSS occurs on a case-by-case basis through the Provincial/District MPs' and Lower Level Government (LLG) Presidents' annual discretionary and non-discretionary funding[3]. However, it is unclear how budget allocations are made or spent – the public financial management systems is very weak and accountability is lacking. On occasion, there are specific standalone national Public Investment Projects (PIPs) especially for larger projects[4]. Except in Eda Ranu and Water PNG areas, O&M are largely unmonitored and appear to be lacking in many areas.

12. **Eda Ranu and Water PNG have specific governing legislations focused on their commercial roles with obligations to operate profitably and deliver financial returns to the state**. Eda Ranu and Water PNG may not have financial incentives to expand their services into typically unprofitable peri-urban areas and smaller urban centers. Ongoing SOE reform initiatives could further emphasize Water PNG to operate on fully commercial and profitable terms, with risks for service provision to less or non-profitable urban centers.

13. **A Community Service Obligation (CSO) policy for SOEs meant to address the discouragement to service unprofitable areas was approved in December 2013 but have yet to be implemented**. This policy provides for Government funding to SOEs to cover for revenue gaps in providing goods and services in areas mandated by the government to the SOE but where revenue from user charges are insufficient to cover full cost or provide a commercial return. However, the policy does not provide the process or method of how such revenue support could be requested for. A detailed implementation guideline may be needed.

14. **The National WaSH Policy is crucial to the effort to remedy the hitherto fragmented and uncoordinated provision of WSS services in PNG**. The Policy was developed under the leadership of DNPM, and was approved by the National Executive Council (NEC) in January

[2] Water Supply and Sanitation in Papua New Guinea: Turning Finance into Services for the Future, Water and Sanitation Program (July 2013)

[3] Currently, each district receives PGK15 million per year for development spending.

[4] Frequently funded with donor assistance. The European Union, the Asian Development Bank and the Japan International Cooperation Agency are amongst the key development partners financing sector projects in recent years.

2015. It is a culmination of several years of Government effort, supported by donors and non-government stakeholders, to develop PNG's first sector-wide national policy for the development, management and implementation of service provision infrastructure in the WaSH sector. The Policy provides for the establishment of a National Water, Sanitation and Hygiene Authority (NWSHA) for policy implementation, sector regulation, coordination and systemization, monitoring and capacity building.

15. **Given the hitherto policy and institutional vacuum, the implementation of the National WaSH Policy is a huge challenge**. Severe capacity constraints, exemplified by the lack of experienced human resource, pose an immediate challenge. The NEC has endorsed the realistic approach of focusing on the establishment of a modest WaSH PMU in DNPM as a nascent pre-cursor to an eventual NWSHA. Over time, the WaSH PMU will be strengthened and expanded to systematically assume more and more of the roles and functions envisaged for the NWSHA, while the longer term efforts to legally establish the NWSHA are undertaken in parallel.

C. Higher Level Objectives to which the Project Contributes

16. **The project is consistent with the World Bank Country Partnership Strategy (CPS) for FY13 – 16[5], extended by two years through FY2018**. The CPS recognized that the historical lack of policy attention to, and public funding for, WSS were beginning to turn around. A niche role for the Bank was planned to provide sector policy advice and technical assistance under Pillar 1 (Increased and more gender-equitable access to inclusive physical and financial infrastructure), to help build consensus around WSS priorities, possibly to be followed with WSS investments later.

17. **The project is a demonstration of the Bank's knowledge and technical assistance activities leading directly to operations**. The Bank, through the Water and Sanitation Program (WSP), had provided technical assistance to the Government since 2012, leading to the development of the National WaSH policy. The Government has now requested continued assistance from the Bank to support the implementation of the Policy. The project and the Bank's continued technical assistance are expected to include (i) further policy and sector management advice, (ii) support to develop and established various new institutional, planning, financing and monitoring processes and instruments, and (iii) the identification, financing and implementation of service delivery infrastructure.

18. **The proposed project contributes to the Bank's twin goals of reducing poverty and ensuring shared prosperity**. A key tenet of the project is the expansion of the provision of WSS services into areas that are currently unserved. The project will also support the development and establishment of a systematic WaSH planning process and investments in rural areas, where the incidence of poverty is most prevalent. The goals of the National WaSH Policy include: (i) reducing morbidity and mortality caused by water-related diseases, (ii) improving livelihood opportunities and economic growth through improved health and reduced economic and financial losses, and (iii) increasing the equity of services between rural, peri-urban and urban areas, and to disadvantaged groups. PNG currently ranks at the bottom of the Pacific

[5] Report No. 71440-PG dated November 8, 2012.

countries for all WaSH related health statistics. Diarrhea is a major cause of morbidity in the country and WaSH related deaths are estimated at over 6,000 per year. In 2009, cholera re-emerged in PNG after an absence of 50 years. Studies in the region have shown that poor access to WSS has a significant national economic impact, as well as causing considerable hardship for households and communities.

II. PROJECT DEVELOPMENT OBJECTIVE

A. PDO

19. The PDO is to support the development and strengthening of the planning and implementation capacity of water sector institutions, and to increase access to water supply services in selected urban towns and rural districts.

20. The first part of the PDO will be achieved by supporting: (i) the development and strengthening of the WaSH PMU at the national level, and Water PNG and selected District Development Authorities (DDAs) at the urban and rural service provision levels, and (ii) the development of selected sector management instruments. For the second part of the PDO, up to nine towns and 10 districts are expected to benefit directly from project infrastructure investments in town and rural water and sanitation schemes. The focus in urban areas will be on water supply, but some rehabilitation of urban sanitation systems may be financed. Rural schemes will include training to improve hygiene and sanitation practices.

B. Project Beneficiaries

21. The direct beneficiaries will be the population of towns and districts where WSS schemes will be financed by the project i.e., about 40,000 and 70,000 urban and rural population respectively. Nevertheless, the key project objective is to support the establishment of a systematic planning, development and monitoring framework to lay the groundwork for sustainable expansion of services.

C. PDO Level Results Indicators

22. **The PDO indicators will reflect the specific outcomes that the project is aiming to achieve**. The first set of indicators are related to sector institutional outcomes. This will be anchored around the development and implementation of selected key sector management and monitoring instruments, in particular those that are directly supported by the project. The second set of indicators are related to access improvement outcomes. This will be anchored around the increase in access to water supply in a selected number of urban towns and rural villages, and training to improve hygiene behavior and practices in these towns and villages. The specific PDO level indicators are proposed to be:

(a) The development and adoption of the 5-year WaSH Sector Strategy
(b) The number of District WaSH Development Plans (including investment plans) adopted.
(c) Number of people provided with access to improved water sources under the project (urban)
(d) Number of people provided with access to improved water sources under the project (rural)

23. Project intermediate indicators include:

(a) The development and establishment of a WaSH Management Information System (MIS).
(b) Improved community water points constructed or rehabilitated under the project.
(c) People trained to improve hygiene behavior or sanitation practices under the project (male and female)[6]
(d) New piped household water connections that are resulting from the project intervention.
(e) Piped household water connections that are benefiting from rehabilitation works undertaken under the project.
(f) Increase in volume of safe water supplied to households (urban).
(g) Reduction in non-water revenue (NRW) in Water PNG's operations (urban).

III. PROJECT DESCRIPTION

A. Project Components

24. Three major components are proposed for the project. A fourth additional Contingent Emergency Response component has been provisioned for the Bank to provide emergency support in the event of a natural disaster, emergency and/or catastrophic event. The three major components are the (1) National WaSH Policy Component, (2) Rural and Peri-urban Water and Sanitation (WSS) Component, and (3) Urban WSS Component. The rural and peri-urban WSS component, and the urban WSS component, are in turn subdivided into a policy implementation or institutional strengthening subcomponent and an associated infrastructure investment subcomponent. Given the phasing and pace of supports to the different sub-sectors, funding allocation is expected to be largest in the urban WSS component.

Component 1: Institutional structures for the implementation of the National WaSH Policy (IDA - US$5.00 million)

25. This component is focused on supporting the development of the key sector institution i.e., the WaSH PMU, and key sector tools (strategies, plans and sector instruments) that will form the management framework of the sector as envisaged in the National WaSH Policy. At the end of the project, it is envisaged that the WaSH PMU will be able undertake its basic mandate of development planning and facilitating investments in the rural and peri-urban areas. A sector monitoring system is to be developed and is expected to begin operations during the project period.

Component 2: Rural and Peri-urban Water and Sanitation (IDA - US$13.35 million)

26. This component will support the WaSH PMU to develop a framework for the coordination, planning and implementation of rural and peri-urban WSS. It is envisaged that the delivery of services will be through the subnational authorities, in particular the new District Development Authorities (DDAs). The primary role of the WaSH PMU is to coordinate and provide a systematic national framework (including common policies, guidelines, financing frameworks and mechanisms, monitoring, regulations, etc.) and supporting the subnational

[6] The project does not expect to directly finance household sanitation facilities, but will focus on hygiene change behavior and advocacy that will indirectly encourage households to obtain improved latrine facilities.

authorities for rural and peri-urban WSS development and investments. Component activities will focus on supporting and building the capacity of the DDAs to plan, develop, implement and monitor rural WSS. This component will pilot the development of District WaSH Development Plans in up to four selected pilot districts. This will provide lessons on how the WaSH PMU could work through subnational authorities toward a systematic increase of access to services in districts. At the same time, the development of these plans provides the opportunity for building the capacity of DDAs in WaSH. Upon the successful development of district plans, selected investments in rural WSS based on these plans are expected to be undertaken. Upon the successful pilot stage, support could be scaled up to other districts.

Component 3: Urban Water and Sanitation (IDA - US$51.65 million)

27. This component is focused on supporting the expansion of WSS services to urban areas, specifically in district and provincial towns where Water PNG has the mandate to provide these services. It is envisaged that a rolling program of design and investment support for new provincial and district town schemes would be carried out. Investment will commence with a first priority town scheme, which has been designed during project preparation, to test out and pave the way for a smooth rolling investment program. Given the water security and sustainability issues linked to climate change risks, optimal design for water conservation, energy efficiency, and source sustainability will be pursued. Other town schemes, to be identified from the pool of currently unserved district and provincial towns, will follow suit during implementation. This component will also support technical and financial improvements in Water PNG's existing operations. These existing operations would be assessed through technical audits and priority recommendations for improvement-focused rehabilitation of existing water and sanitation infrastructure implemented with project support. This will complement Water PNG's existing re-investment program[7] to improve performance and extend service provision. This component will also support an assessment of Water PNG's existing operating model, in particular to identify potential future options to ensure continued financial viability as it expands service provision to new (and generally small and less profitable) district towns[8].

Component 4: Contingent Emergency Response (US$0 million)

28. Given PNG's vulnerability to climate and disaster risks this 'zero component' (initially without any allocated funding) is proposed to be included. This Component will allow for the rapid reallocation of funds from other components to provide emergency relief, recovery and reconstruction support in the event of a natural disaster, emergency and/or catastrophic event. Such reallocated funds would be disbursed either against a positive list of critical goods and/or against the procurement of works, and consultant services required to support the immediate response and recovery needs. Implementation will be guided by a Contingent Emergency Response Implementation Plan (CERIP) to be developed in response to the emergency. The PDO does not reference the contingent emergency component. However, in the event of an emergency, the project would undergo a restructuring to incorporate an Immediate Response Mechanism (IRM)-specific objective to the PDO and revision of the results framework. This

[7] Which amounted to about US$ 7 million in 2015.
[8] Water PNG's operating model should also need to take into account the provisions of the DDA Act (2014).

component would be monitored using appropriate indicators identified as part of the standard materials to be in place before the triggering of an emergency event.

B. Project Financing

29. The International Development Association (IDA) and Independent State of Papua New Guinea (the Recipient) will enter into a Financing Agreement. Water PNG will enter into a Project Agreement with IDA. Given the Government's CSO policy, the Government will on-grant to Water PNG the credit proceeds allocated for Component 3, through a Subsidiary Agreement.

C. Project Cost and Financing

30. The estimated total project cost is US$77.3 million, of which the IDA credit will fund 100% of all project component expenditure of US$70.0 million (inclusive of taxes). Counterpart funding will finance Government and Water PNG staff assigned to implement the project, and their associated overhead costs, estimated at a total of US$7.3 million.

Table: Total Project Costs

Project Components	Project cost (US$ million)	IDA Financing (US$ million)	Counterpart Financing (US$ millions)	% Financing
1. Institutional structures for the implementation of the National WaSH Policy	5.00	5.00	0.00	100%
2. Rural and Peri-urban Water and Sanitation	13.35	13.35	0.00	100%
3. Urban Water and Sanitation	51.65	51.65	0.00	100%
4. Contingent Emergency Response	0.00	0.00	0.00	100%
Sub – total	**70.00**	**70.00**	**0.00**	**100%**
WaSH PMU (DNPM) and Water PNG staff and overhead cost	7.30	0.00	7.30*	0%
Total project Cost	**77.30**	**70.00**	**7.30**	**90%**

* These are estimates of counterpart funding costs for the duration of the project.

D. Lessons Learned and Reflected in the Project Design

31. This project is the first Bank operation in the WSS sector in PNG. Nevertheless, several key lessons from previous Bank WSS projects elsewhere and other operations in PNG are reflected in the project design. These are summarized in Annex 2.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

32. The project will be implemented through the appropriate existing sector institutions in line with the National WaSH Policy. Implementation technical assistance in rural WaSH, engineering, institution and capacity development, monitoring and evaluation, communications, environmental and social safeguards, financial management and procurement will be provided as necessary.

33. DNPM (through the WaSH PMU) will implement Components 1 and 2, i.e., those related to the implementation of the National WaSH Policy and the provision of WSS services in rural and peri-urban areas. The WaSH PMU will also be responsible for overall coordination of Components 1, 2 and 3 of the Project, sector coordination and policy implementation. The WaSH PMU is led by a WaSH Sector Coordinator and initially has a core minimum complement of staff from DNPM. The project will immediately strengthen this weak capacity with a complement of specialist consultants sufficient to undertake project implementation and management. Water PNG will implement Component 3, i.e., those related to the provision of WSS services in district and provincial towns. Water PNG has formed a dedicated project Management Unit (PMU-WPNG). Although Water PNG has a track record of implementing, supervising, monitoring and evaluating donor financed WSS projects of comparable size, human resources constraints will limit the volume of investments that it can simultaneously undertake. Thus, implementation will be phased and implementation technical assistance will be provided.

B. Results Monitoring and Evaluation

34. The WaSH PMU and Water PNG will submit quarterly reports that would describe implementation progress and highlight issues that need attention (including safeguards compliance and mitigation actions). Additionally, a mid-term review of project performance will be carried out by the WaSH PMU, Water PNG and the Bank no later than 30 months after project effectiveness. A Monitoring and Evaluation (M&E) advisor will be provided to support the WaSH PMU's M&E function. At the sector level, the project is supporting a sector Management Information System (MIS), to be rolled out in stages. While the sector MIS system itself is not a necessity for adequate project monitoring, it can provide secondary data for project monitoring.

35. High level oversight will be provided by the WaSH Task Force. The Task Force originally oversaw the development of the National WaSH Policy. Given its good understanding of the Policy and its broad representation[9], it is uniquely positioned to provide such an oversight. Task Force meetings also act as the forum for multi-stakeholder review of the sector and the implementation status of the National WaSH Policy. Additionally, Kumul Consolidated Holdings[10] (KCH) oversees Water PNG's overall viability as a going business concern.

C. Sustainability

36. The project directly supports the Government's sector reform agenda that will lead to a harmonized and systematic management and service delivery framework, underpinned by the National WaSH Policy. The demonstrated Government commitment thus far and the project design principles provide the reassurance that the momentum gained and progress thus far can be sustained. A measure to reduced sustainability risk is provided through phased support

[9] Including the DNPM, the Department of Treasury, Department of Health, Department of Implementation and Rural Development, Department of Provincial and Local Level Government Affairs, Department of Environment and Conservation, Department of Education, Department for Community Development and Religion, Department of Works, Kumul Consolidated Holdings, Water PNG, Eda Ranu, World Health Organization, UNICEF, the European Union, World Vision and WaterAid. The WaSH Task Force also has the mandate to include additional NGO representative(s) and request specific technical assistance as required.

[10] As the shareholder and regulator of State-Owned Enterprises (SOEs).

differentiated amongst the various sub-sectors of rural water, rural sanitation, urban water and urban sanitation. Project support in each sub-sector has been matched to the pace of development in sub-sector, reducing the risk of unsustainable investment.

37. Rural WSS infrastructure investments will be undertaken within the context of district-wide WaSH development plans. These development plans will include specific sustainability plans which are required by the National WaSH Policy. In urban WSS, Water PNG has a demonstrated track record of financial viability. It is financially and commercially well regulated by the Independent Consumer and Competition Commission (ICCC), PNG's economic regulator and consumer watchdog. There are regular tariff adjustments. The project-financed expansion into up to 9 new operations is not expected to pose financial viability issues. Nevertheless, the project will provide technical assistance to support a review for alternative delivery models to maintain Water PNG's long-term viability should it further expand significantly in the future.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

38. The overall implementation risk is considered **Substantial**. The key identified high or substantial risks mainly relate to the commitment risks for the longer term implementation of the National WaSH Policy and fiduciary risks due to institutional capacity weaknesses.

39. **While the commitment to the National WaSH Policy is currently very high, political commitment will need to be sustained over a substantial period of time for the Policy to be fully implemented**. The WaSH PMU has been set up and a WaSH Sector Coordinator recruited to lead the Policy implementation. The PNG 2016 budget includes, for the first time, a budget vote of PGK 1 million specifically to the WaSH sector. The NEC has also confirmed the WaSH Task Force's role of continued oversight over Policy implementation. The project has been deliberately designed to focus on supporting the development of the most fundamental instruments (sector strategies, district level WaSH development plans, and sector monitoring databases) and ensuring the parallel demonstration of actual infrastructure investments as the means to build and maintain broad support for the Policy over time.

40. **Institutional capacity weaknesses lead to implementation, governance and fiduciary risks.** These are exacerbated by the dispersed or remote locations of some project sites. Water PNG has successfully implemented sizable donor-funded infrastructure projects but not Bank-financed projects, while the WaSH PMU is newly created with minimum staffing. To mitigate the fiduciary risks, the project will support the augmentation of the implementing agencies' teams with individual external consultants with requisite skills and experience. Training and capacity building will also be provided by Bank staff and external consultants. The WaSH communications and promotions plan will also play a key role to help obtain the buy-in and participation of communities to help mitigate governance risks.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

41. The availability of data is extremely limited on the ground. For the infrastructure investments in Component 3 where potential subprojects with available data can be identified, numerical cost – benefit analysis was applied. Economic and financial analysis were carried out for Bialla and Bulolo towns water supply systems, where the technical parameters, which are the basis for the economic and financial analysis, were available.

42. Results show that both water supply systems are economically and financially viable. The base case economic and financial internal rate of returns (IRR) and net present values (NPV) are presented below. While financial indicators point to modest but sustainable viability, economic returns are high. Similar analysis are expected to be made during the feasibility assessment and design stage of further town schemes identified during implementation[11].

Viability Indicators	Bialla	Bulolo
ENPV (PGK)	11,216,300	11,490,701
EIRR (%)	28%	26%
FNPV (PGK)	2,824,227	2,251,339
FIRR (%)	2%	2%

B. Technical

43. The European Union (EU) has provided short term technical assistance to the WaSH PMU to begin to develop the 5-year WaSH Strategy, the WaSH PMU's Organizational Development Plan, the WaSH Operations Manual and the WaSH Communications and Promotions Plans. The results of this technical assistance will form valuable inputs to the project, which will support further development and the subsequent implementation of these key elements of the National WaSH Policy. For rural WSS, the initial focus will be the pilot District WaSH Development Plans, for which draft Terms of Reference (TOR) have been prepared.

44. For urban areas, the envisaged WSS schemes will be modest in size. Typical reticulated water systems with relatively small volumes are anticipated, sourced from groundwater or nearby surface water sources. Water PNG has prepared a list of 22 water supply schemes based on a needs assessment and district and provincial commitments[12]. Out of these, the project will initially finance the construction of the Bialla water supply systems. The draft design and bidding documents for the Bialla water supply system has been reviewed by the Bank (from both technical and safeguards perspectives) and are being finalized. It is estimated that up to further eight town schemes will be identified, selected and designed during implementation. The draft TORs for (i) additional technical staff, (ii) the construction supervision consultants, and (iii) the design consultants for the next batch of towns to be chosen, have been prepared.

45. The project has provisioned for the rehabilitation and retro-fitting of Water PNG's existing water supply systems for improved operational efficiencies. An assessment of

[11] The Project Implementation Manual will outline the assessment processes.
[12] There are about 75 district and provincial towns that are currently not yet served with piped water services.

rehabilitation requirements and a technical audit will provide recommendations of relevant priority rehabilitation investments. While Water PNG is operating profitably, its systems are plagued by very large inefficiencies e.g., average non-revenue water is 35%. There are potentially large opportunities for water and energy conservation, efficiency gains and revenue enhancements.

C. Financial Management

46. A financial management (FM) assessment was carried out for each implementing agency in accordance with the "Principles Based Financial Management Practice Manual" effective March 1, 2010. The assessment concluded that the proposed project FM arrangements are acceptable to the Bank and provide reasonable assurance that funds will be used for the intended purposes, following the implementation of agreed risk mitigation measures. The main FM risks are (i) the DNPM and Water PNG lack experience with World Bank-financed projects, and the WaSH PMU in DNPM is newly created and needs to be resourced; (ii) potential delays in gaining necessary approvals and in the timeliness of submission of reports; and (iii) substantial infrastructure investments and grants at subnational level, operating in environments with low fiduciary capacity, and often in remote locations.

47. To mitigate the risks, technical assistance will be provided under the project to enhance the capacity of implementing agencies to perform FM functions, and to provide ongoing advisory support as needed. Dedicated project finance officers will be recruited, one each for the WaSH PMU in DNPM and the PMU-WPNG. Training and capacity building will be provided by external consultants together with support from Bank staff, including training on Bank policies and procedures. FM procedures and systems will be integrated as much as possible with the existing requirements of the implementing agencies. Any area not adequately covered in the implementing agencies policies and procedures, will be detailed in the Project Implementation Manuals (PIMs). An adequate internal control framework will be maintained, including internal controls over the infrastructure investments and grants (the latter to be detailed in a Community Schemes Grant Implementation Manual), and potential inclusion of Component 3 within the audit scope of Water PNG's existing internal audit function.

D. Procurement

48. Procurement for the proposed project will be carried out in accordance with the World Bank's - Guidelines: Procurement Under IBRD Loans and IDA Credits dated January 2011 (Revised July 2014); and - Guidelines: Selection and Employment of Consultants by World Bank Borrowers dated January 2011 (Revised July 2014), and the specific provisions stipulated in the Legal Agreements. Further details of procurement thresholds and implementation arrangements are provided in Annex 3. Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and revised in January 2011, shall apply to the project.

49. The procurement capacity assessments of Water PNG and DNPM identified the following main risks: (i) inefficiency due to a potential excessively long period between the identification of procurement need to contract signature; (ii) delay to project implementation due to limited procurement capacity and resources; and (iii) delay to project implementation due to

constraints in contractors' capacity. Key mitigation measures include the following: (i) Water PNG staff to be trained on Kumul Consolidated Holdings (KCH) approval processes and DNPM staff to be trained on Central Supply and Tenders Board (CSTB) approval processes; (ii) implementing agencies to develop Key Performance Indicators to monitor procurement activities; and (iii) establishing procurement expertise within the implementing units.

E. Social (including Safeguards)

50. The overall social impact of the project is expected to be strongly positive, with the provision of reticulated water supply to district and provincial towns and rural settlements having numerous benefits. The positive impacts include: (i) improved quantity and quality of safe drinking water, (ii) reduction in water related diseases such as diarrhea, dysentery, cholera, typhoid and associated healthcare costs, (iii) reduction in infant, child and maternal mortality and morbidity due to improved health and sanitation services, (iv) reduced distances to water points which will lead to gains in productive time for women and girls, and (v) better and properly sited sanitation facilities which will reduce the risk of contamination of surface and groundwater resources. Potential negative social impacts are associated with poor water quality from the new supply systems. To avoid potential impacts raw water will be treated with disinfecting agents such as chlorine and treated water will be regularly monitored at several points in the distribution system against World Health Organization (WHO) drinking water quality guidelines.

51. Most subprojects have not been identified prior to Appraisal, hence an Environmental and Social Management Framework (ESMF) has been prepared to provide a framework to guide the environmental and social screening and assessment of subproject activities. For Component 2, initial efforts will focus on institutional and capacity building, coupled with pilots to develop a limited number of district WaSH Development Plans. Actual project investments are expected to be identified during the second year of the project. For Component 3 (urban component), one town water supply scheme has been identified (Bialla) for initial investment - for which a Limited Environmental and Social Impact Assessment (ESIA) has been prepared and disclosed - and others will be identified and financed during implementation.

52. OP 4.10 Indigenous Peoples has been triggered as indigenous peoples (IP) communities may exist within subprojects' areas of influence. An Indigenous Peoples Planning Framework (IPPF) has been prepared and is incorporated in the ESMF. Subprojects under Component 2 may include rural areas where the majority of beneficiaries are IP. For these subprojects no separate Indigenous Peoples Plan (IPP) will be prepared, with IPP elements instead incorporated into subproject design. Investments under Component 3 are unlikely to meet the four defining criteria for IP communities under the *Environmental and Social Safeguard Instruments for the Pacific Islands* (ESSIP) as most infrastructure will be sited within urban areas which are expected to comprise heterogeneous populations. However ancillary infrastructure (e.g., rising mains from stream-fed water sources) may traverse customary/IP community lands in which case OP 4.10 would be triggered and a subproject specific IPP prepared. A social assessment will be undertaken for each subproject to establish the presence, or otherwise, of IP communities in the respective subproject areas. If present, IP communities will be provided with equitable and culturally-appropriate benefits from the subproject. A process of free, prior and informed consultation with IP communities will be undertaken to establish broad community support.

53. Subprojects requiring involuntary resettlement will be ineligible for project financing. The bulk of land required for water supply infrastructure established under Component 3 subprojects is expected to be Government-owned. In some instances however (e.g., installation of rising mains), private or customary land may be traversed. In these rare circumstances voluntary land donation (VLD) or other negotiated agreement (e.g., lease, easement) will be the mechanism. Under Component 2 (the rural component) VLD will likely be the primary mechanism. Any VLD will follow guidance provided in the ESSIP and a VLD protocol has been included in the ESMF. As a precautionary measure[13] OP 4.12 Involuntary Resettlement has been triggered and a Resettlement Policy Framework (RPF) prepared and annexed to the ESMF.

54. Impacts on physical cultural resources (PCR) are not anticipated. While known physical cultural resources can be avoided by subproject design there is a chance that these resources may be uncovered during the course of civil works, hence OP 4.11 Physical Cultural Resources is triggered. A chance finds procedure has been included in the ESMF to cover these eventualities.

55. **Citizen engagement will be promoted throughout the project design and implementation.** The development of District WaSH Development Plans, and subsequent investments in rural WSS schemes, will be undertaken through a participatory approach as required by the National WaSH Policy. It is envisaged that both activities will be undertaken with the support and facilitation of NGOs (including faith-based organizations) which are already actively supporting various initiatives with community participation in design, implementation and operation. Consultations in Bialla included approximately 200 people (about 50% were women), including subproject beneficiaries and local representatives. Feedback from consulted people provided key contributions toward the final version of the ESMF and the specific ESIA. Similar consultations will be undertaken for other town schemes as they are identified and prepared.

56. **The project will focus attention on gender issues in all relevant activities**. The PNG Country Gender Assessment (CGA) [14] outlines the gender dimensions in the context of the country's development challenges and strategies. While women are taking on more leadership and public representational roles, perceptions of domestic roles and powers, gender equality and gender norms remain entrenched in many communities. Gender inequality remains most apparent at home, where women exercise limited control over resources and over household decision-making. Project implementation support will help the communities make informed choices through wide discussion, including ensuring the participation of women in decision making. Some of these approaches are already practiced in various donor and NGO programs, e.g., the Australian Government supported Civil Society WaSH Fund program includes gender plans for supported schemes and associated Gender Equality and Social Inclusion (GESI) monitoring. The project's support towards the District WaSH Development Plans and the formalization of the associated processes and procedures at the district level will help to systematize and encourage the entrenchment of gender-based approaches in government systems.

[13] In the unlikely event of issues during mid-implementation of subprojects, e.g., dispute of a negotiated settlement.

[14] *Government of Papua New Guinea, Asian Development Bank, Australian Aid, United Nations Development Program, World Bank Group; "Papua New Guinea Country Gender Assessment," 2011-2012*

F. Environment (including Safeguards)

57. OP 4.01 Environmental Assessment is triggered and the project has been classified as Category B. The project is unlikely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. Environmental impacts are site-specific. Few if any of them are irreversible and mitigation measures are readily developed and implemented. Overall, the project is environmentally beneficial. The subproject components are expected to involve simple, appropriate, low cost technologies that do not pose any significant environmental risk. The provision of safe drinking water and proper sanitation is expected to have a significant positive impact on livelihoods and the environment, including reduction in groundwater pollution. Some minor and temporary negative environmental impacts may occur, resulting mainly from construction activities (e.g., construction noise, dust from earthworks, property access limitations etc.). These impacts are readily manageable by standard mitigation measures such as restrictions on working hours, dust management through watering down and temporary access provisions. Noise monitoring will be undertaken in accordance with World Bank EHS Guidelines by the civil works contractor and additional mitigation measures will be employed if guideline limits are exceeded. Observations at Water PNG's existing construction sites suggest that its staff are well-equipped to manage environmental issues at worksites. Operational phase environmental impacts are insignificant. Noise emissions are expected to be insubstantial, with electrical pumps employed and water treatment facilities and backup generator sets enclosed within buildings. Siting of these facilities will consider proximity to sensitive receptors (health facilities, schools, residences, religious centers). Minor quantities of sludge will be generated from the water treatment process, however this material is environmentally benign and can be buried.

58. A key environmental issue is the sustainability of the raw water supply and the avoidance of any environmental impacts from source development. To avoid these impacts, assessments of the proposed water sources will be undertaken to determine their sustainability under the proposed extraction regime. These assessments will consider the ecological values of the water sources, seasonal variations in supply volumes and the proposed extraction regime to determine the source sustainability. Candidate water supply schemes with environmentally unsustainable sources will not be eligible for project financing. The project will not seek to develop water sources that require changes to watershed management regimes or where there is potential for impacts on protected areas or biodiversity (including freshwater habitats). Nor will infrastructure be sited in these areas or in flood zones. Investments in rural sanitation will be limited to hygiene behavior education including technical assistance with simple technologies, i.e. pit latrines. Investments in urban sanitation infrastructure will be limited to the rehabilitation of existing Water PNG sewerage systems. The potential for environmental impacts from the sanitation activities is insignificant.

59. The World Bank Group's Environmental, Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. The relevant Industry Sector Guidelines for the project are the EHS Guidelines for Water and Sanitation (December 2007) which include information relevant to the construction and O&M of water treatment and distribution systems.

G. World Bank Grievance Redress

60. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

PAPUA NEW GUINEA: Water Supply and Sanitation Development Project

Project Development Objective (PDO): to support the development and strengthening of the planning and implementation capacity of water sector institutions, and to increase access to water supply services in selected urban towns and rural districts.												
These results are at:	**Project Level**											
PDO Level Results Indicators	**Core**	**Unit of Measure**	**Baseline**	**Cumulative Target Values**						**Frequency**	**Data Source/ Methodology**	**Responsibility for Data Collection**
				2017	**2018**	**2019**	**2020**	**2021**	**2022**			
Indicator One: Development and adoption of 5-year WaSH Sector Strategy			No Strategy		Strategy Adopted					Annual	WaSH PMU, DNPM, WaSH Task Force (adoption)	WaSH PMU
Indicator Two: Number of District WaSH Development Plans (including investment plans) adopted (cumulative)		No.	0	0	2	4	7	10	10	Annual	WaSH PMU (NGO / facilitator reports)	WaSH PMU
Indicator Three: Number of people provided with access to improved water sources under the project (urban)	X	No. of people	0	0	1,000	6,000	15,000	27,000	40,000	Annual	Water PNG (Customer reports)	Water PNG
Indicator Four: Number of people provided with access to improved water sources under the project (rural) – tracked by gender	X	No. of people	0	0	2,000	13,000	34,000	53,000	70,000	Annual	WaSH PMU (NGO / facilitator reports)	WaSH PMU
INTERMEDIATE RESULTS												
	Intermediate Result (Component One): ***Institutional structures for the implementation of National WaSH Policy***											
Indicator One: Development and establishment of a WaSH Management Information System (MIS)			No MIS				MIS producing timely reports			Annual	WaSH PMU (Progress Report)	WaSH PMU

	Intermediate Result (Component Two): ***Rural and Peri-urban Water and Sanitation***											
Indicator One: Improved community water points constructed or rehabilitated under the project	X	No.	0	0	50	300	900	1,500	2,000	Annual	WaSH PMU (NGO / facilitator reports)	WaSH PMU
Indicator Two: People trained to improve hygiene behavior or sanitation practices under the project (male and female)	X	No. of people Total (Female)	0 (0)	0 (0)	0 (0)	2,000 (600)	6,000 (1,800)	10,000 (3,000)	13,000 (3,900)	Annual	WaSH PMU (NGO / facilitator reports)	WaSH PMU
	Intermediate Result (Component Three): ***Urban Water and Sanitation***											
Indicator One: New piped household water connections that are resulting from the project intervention	X	No.	0	0	100	600	1,500	2,700	4,000	Annual	Water PNG (Project reports)	Water PNG
Indicator Two: Piped household water connections that are benefiting from rehabilitation works undertaken under the project	X	No.	0	0	0	0	500	1,000	2,000	Annual	Water PNG (Project reports)	Water PNG
Indicator Three: Increase in volume of safe water supplied to households		m3/yr	0	0	25,000	150,000	375,000	675,000	1,000,000	Annual	Water PNG (Project reports)	Water PNG
Indicator Four: Non-Revenue Water (NRW) in Water PNG's operations		%	34%	34%	34%	33%	32%	30%	28%	Annual	Water PNG (Project reports)	Water PNG

Notes: It should be noted that the exact districts, rural WSS schemes and district and provincial towns to be financed by the project have not been confirmed at the time of project commencement. The results indicator targets have been estimated based on likely towns/schemes, and taking into account likely units costs based on experiences from previous projects of development partners and Water PNG. These targets will be reviewed again at the end of the first year of implementation and will be adjusted if necessary during the mid-term review.

Appendix 1 to Annex 1: Results Framework and Monitoring

Country: Papua New Guinea

Project Name: Water Supply and Sanitation Development Project (P155087)

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)
Development and adoption of 5-year WaSH Sector Strategy	Signals the adoption of the 5-year WaSH Sector Strategy, which among others include a roll out plan for the National WaSH Policy over the next 5 years in rural and peri urban areas.
Number of District WaSH Development Plans (including investment plans) adopted (cumulative)	Measures the number of District WaSH Development Plans adopted (one per district), which then forms the basis for district WaSH schemes implementation.
Number of people in urban areas provided with access to Improved Water Sources under the project	This indicator measures the actual number of people in urban areas who benefited from improved water supply services that have been constructed under the project. Improved water sources include piped household connections (house or yard connections), public standpipe, boreholes, protected dug well, protected spring and rainwater collection. Hence, "Improved Water Sources" do not include, inter alia, water provided through tanker truck, or vendor, unprotected well, unprotected spring, surface water (river, pond, dam, lake, stream, irrigation channel), or bottled water. The definition of what is considered an 'improved water source' follows the UNICEF-WHO Joint Monitoring Program definition. Note that "Improved Water Sources" does not refer to the question of new versus rehabilitated water sources, but is the standard definition used to track progress on the Millennium Development Goals. = Number of new connections x [8 person], using the approximate household size in NCD as proxy for urban household size.
Number of people in rural areas provided with access to Improved Water Sources under the project	This indicator measures the actual number of people in rural areas who benefited from improved water supply services that have been constructed under the project. "Improved water sources" include piped household connections (house or yard connections), public standpipe, boreholes, protected dug well, protected spring and rainwater collection. Hence, "Improved Water Sources" do not include, inter alia, water provided through tanker truck, or vendor, unprotected well, unprotected spring, surface water (river, pond, dam, lake, stream, irrigation channel), or bottled water. The definition of what is considered an 'improved water source' follows the UNICEF-WHO Joint Monitoring Program definition. Note that "Improved Water Sources" does not refer to the question of new versus rehabilitated water sources, but is the standard definition used to track progress on the Millennium Development Goals. = Number of new connections x [40 person], using the approximate people per connections observed in previous development

	partner and NGO projects. In addition, the percentage between men and women provided with access will be tracked.

Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)
Development of a WaSH Monitoring Information System (MIS)	Signals the commencement of a functioning MIS system capable of producing timely reports. Initially the system is not expected to have full national data. The sector MIS is expected to be rolled out in stages, beginning in the pilot District WaSH Development Plan districts.
Improved community water points constructed or rehabilitated under the project	Number of improved community water points constructed or rehabilitated under the project in rural and urban areas. A community water point is defined as a public outlet for the provision of water supply to a number of households. Improved community water points refer to standpipes, protected dug well, borehole, or protected spring. Hence, improved community water points do not include, inter alia, unprotected wells or unprotected springs.
People trained to improve hygiene behavior/sanitation practices under the project	This indicator measures the cumulative number of people who have participated in a training activity to conduct improved hygiene behavior or sanitation practices. This does not include people who have been educated and/or informed through public information or mass publication campaigns. The baseline value for this indicator is expected to be zero.
New piped household water connections that are resulting from the project intervention	Number of new piped household water connections which result from the project intervention. A piped household water connection is defined as a connection that provides piped water to the consumer through either a house or yard connection. Hence, they do not include, inter alia, standpipes, protected well, borehole, protected spring, piped water provided through tanker trucks, or vendors, unprotected wells, unprotected spring, rivers, ponds and other surface water bodies, or bottled water.
Piped household water connections that are benefiting from rehabilitation works undertaken by the project	Number of piped household water connections benefiting from rehabilitation works. This indicator is measured as the number of piped household water connections benefiting from rehabilitation works. Rehabilitation works are undertaken so that existing customers see the quantity and/or quality of their water supply services enhanced.
Increase in volume of safe water supplied to households (in towns)	Volume of safe water supplied to consumers from new towns' systems.
Non-Revenue Water (NRW) in Water PNG's operations	Reduction in Non-Revenue Water (NRW) in Water PNG's operations. NRW is defined as the percentage of water produced that is not ultimately billed to consumers. Water not billed to consumers results from water losses (physical and commercial losses) as well as authorized consumption that are not billed.

Annex 2: Detailed Project Description

PAPUA NEW GUINEA
Water Supply and Sanitation Development Project

1. **Building the national level WaSH sector institutional structure**. The overall aim of the project is to support the implementation of the National WaSH Policy, which will begin to put in place the first national level WaSH sector-wide policy, development planning, management and monitoring framework in PNG. A summary of the key objectives and targets of the National WaSH Policy is provided in Box A2.1. The project will support the development, establishment and strengthening of national sector institutions (in particular the WaSH PMU) and sector tools (strategies, plans and systems) that will form the management framework of the sector as envisaged in the National WaSH Policy. This support is the basis of Component 1 of the project.

Box A2.1: Summary of the National WaSH Policy

The National WaSH Policy aims to contribute towards improving living standard and the quality of life through the provision of equitable access to safe, convenient and sustainable water supply and sanitation (WSS) and to improve hygiene practices and long term behavior change at the personal, household, community and institutional level particularly in rural and urban settlement areas that are currently under-served. The ultimate goal of this policy when implemented through a well-coordinated approach fully supported and funded by the government will be to achieve the following outcomes:

- Reduction in morbidity and mortality caused by water related diseases;
- Improve livelihood opportunities and economic growth through improved health and reduced economic and financial losses; and;
- Increase equity of services between rural, peri-urban and urban areas, and to the disadvantaged;

The National WaSH Policy identifies the following targets to be achieved by 2030:

For Water Supply:

- In rural areas, 70% of the population has access to a safe, convenient and sustainable water supply.
- In urban areas, 95% of the population has access to a safe, convenient and sustainable water supply.
- 100% of educational institutions and medical centers across the country have access to a safe, convenient and sustainable water supply.

For Sanitation:

- In rural areas, 70% of the population has access to safe, convenient and sustainable sanitation facilities.
- In urban areas, 85% of the population has access to safe, convenient and sustainable sanitation facilities.
- 100% of educational institutions and medical centers have access to safe, convenient and sustainable sanitation facilities.

For Hygiene:

- 100% of educational institutions and medical centers have handwashing facilities with running water and soap.
- 100% of the households that have access to an improved water supply practice total sanitation.

The National WaSH Policy outlines seven Strategies to achieve these targets:

- Improved sector coordination and leadership. This will include the establishment of a new Authority to take on the leadership role of coordination between stakeholders.
- Increased WaSH sector funding
- Developing and implementing an effective monitoring and evaluation system for the sector.
- Improved and consistent approaches to WaSH service delivery
- Appropriate technology promotion
- Enhanced private sector participation and partnerships
- Increased sector capacity building and training

2. **Building institutional structures and expanding access to services at the service provision level**. The ultimate objective is to increase access to, and improve the quality of, water and sanitation services to the population of PNG as well as improve hygiene behavior and practices. Consequently, the project will work simultaneously at the service provision level – in the rural and urban areas respectively. The project will first aim to help develop, establish and/or strengthen institutions responsible for service delivery. Based on the foundation of capable service delivery institutions which will help ensure sustainability, the project will finance water and sanitation investments to directly contribute to increased access to service provision. These are the basis of Component 2 (Rural WSS) and Component 3 (Urban WSS) of the project.

3. **Coordination with Government, development partners and NGOs**. Necessarily, the project will need to be coordinated with the overall activities and efforts of the Government's own direct efforts to implement or support the implementation of the National WaSH Policy. The Bank will also coordinate support with existing and future development partners active in supporting the WaSH sector in general, and supporting the implementation of the National WaSH Policy in particular. Various NGOs are active in supporting community-level WaSH schemes. These NGOs are expected to be invaluable partners that will help the capacity building of the new district-level government institutional structure and facilitate the subsequent rural water and sanitation investments. The various existing methodologies, processes and management arrangements of rural water and sanitation in PNG pioneered by these NGOs are expected to be the basis for the eventual establishment of common rural water and sanitation guidelines by the WaSH PMU.

4. **The project concept and design need to be aligned to the current status, pace of development and the financing absorption capacity of each different water sub-sectors of rural water, rural sanitation, urban water and urban sanitation**. In rural water and sanitation, there are currently no systematic or integrated planning or financing mechanisms in place that could provide for a comprehensive national planning and decision making, financing and implementation of rural water and sanitation infrastructure. Consequently, the focus for rural water and sanitation would be on building the institutions and establishing district level WaSH planning and decision making, before beginning to scale up the pace of infrastructure investment to increase access. On the other hand, infrastructure investment in urban water could be undertaken through a well-established state-owned utility i.e., Water PNG, albeit only at a suitable pace of investments compatible with Water PNG's capacity. With regards to urban

sanitation, most urban centers are relatively small and of low density such that improved septage management and hygiene behavior are likely to be the most appropriate immediate efforts. However, priority rehabilitation of existing Water PNG sanitation infrastructure could also be undertaken.

5. Since this project is the first Bank operation in the water supply and sanitation (WSS) sector in PNG, there are no direct lessons from specific previous Bank WSS projects in the country. Nevertheless, several key lessons from previous Bank WSS and other operations in PNG and elsewhere are reflected in the project design. Key lessons are summarized in Box A2.2.

Box A2.2: Summary of Key Lessons from Previous Projects

(a) *There should be an effective champion*. Leadership to develop and implement the National WaSH Policy has been earnestly taken on board by the Department of National Planning and Monitoring, which has also been confirmed by the National Executive Council (NEC) to be the lead for the sector.

(b) *Project should be compatible with and complementary to overall Government activities*. Ownership and commitment are obtained by directly supporting the Government's implementation of the National WaSH Policy.

(c) *The provision for and timely availability of counterpart funding has been an issue for ongoing Bank projects in PNG*. In the case of the WSS sector, this issue is expected to be exacerbated given that the National WaSH Policy is new and hitherto there is no central government agency designated with overall responsibility for the development planning, financing and management of the sector. The project is designed with no direct central government counterpart financing - except for the funding of WaSH PMU and Water PNG project staff for which either such recurrent staffing costs are already in the government budget or there have been precedents from other Bank projects in PNG. All project-financed expenditures will be 100% project funded i.e., there will not be co-mingling of Bank and Government funding.

(d) *The Bank is most effective when it uses the range of technical assistance and lending instruments, as well as its convening power, at its disposal to provide a package of sustained and comprehensive program in support of the client's development agenda*. Utilizing its vast experience in sector policy, institutional framework, regulations and reform, the Bank (through the Water and Sanitation Program) has directly supported the Government since 2012 on the development of the National WaSH Policy – the first such sector policy framework in PNG. The Bank is now following through its knowledge products into implementation, with the project directly supporting the implementation of the Policy. The project will bring to bear the Bank's substantial experience in assisting client governments in implementing institutional building, policy reform, infrastructure financing/construction and sustainable operation in difficult and challenging developmental contexts. Policy, institutional strengthening, sector management and project management advice will continue during implementation through the Bank's implementation support missions. At the same time, the Bank will continue to engage other development partners active in the sector in PNG towards coordinated and common approaches aligned to the National WaSH Policy.

6. **Project components**. Three major components are proposed for the project. These are the (1) National WaSH Policy Component, (2) Rural and Peri-urban Water and Sanitation (WSS) Component, and (3) Urban WSS Component. The rural and peri-urban WSS component, and the

urban WSS component, are in turn subdivided into a policy implementation or institutional strengthening subcomponent and an associated infrastructure investment subcomponent.

7. **Component 1: Institutional structures for the implementation of the National WaSH Policy**. This component is focused on supporting the development of the key sector institution i.e., the WaSH PMU, and key sector tools (strategies, plans and sector instruments) that will form the management framework of the sector as envisaged in the National WaSH Policy. At the end of the project, it is envisaged that the WaSH PMU will be able undertake its basic mandate of development planning and facilitating investments in the rural and peri-urban areas. A sector monitoring system is to be developed and is expected to begin operations during the project period. Component 1 is subdivided into: (a) a subcomponent to support the establishment, operationalization and strengthening of the WaSH PMU, and (b) a subcomponent to support the development and/or implementation of key sector tools.

(a) Support to the establishment, operationalization and strengthening of the WaSH PMU.

(i) *Office rehabilitation and refurbishment*. Refurbishment of office space as needed, including office partitioning and provision of furniture.

(ii) *Vehicles*. Purchase of vehicle(s) for the day-to-day operation of the WaSH PMU.

(iii) *Office Equipment*. Purchase of a set of computers, printers, telecommunications equipment, cameras, photocopiers and accessories, and other office equipment.

(iv) *Incremental Operating Costs*. Limited support to the incremental running cost reasonably incurred on account of project implementation, support, management, and monitoring and evaluation (subject to a cumulative ceiling). Expenses may include utilities and supplies, bank charges, office rentals, communications, media campaigns, stationery, advertising expenses, vehicle operation, maintenance, and insurance, and domestic travel costs, but excluding salaries, fees, honoraria, and bonuses of members of the Recipient's civil service.

(v) *Technical Assistance*. A range of individual consultancy services in the areas of WaSH planning, policy making, infrastructure development planning, sector regulations, financial management, procurement (including specialists to advise on specific procurement evaluation, as necessary), environmental and social management, as well as project implementation and management[15].

[15] The primary purpose of the WaSH PMU is to lead the implementation of the National WaSH Policy, eventually developing and transforming itself into the National Water Supply, Sanitation and Hygiene Authority (NWSHA) sometime in the future. However, it also has a second role of implementing the Bank project. As such, technical assistance provided could likely span those related to its larger sector lead role as well as those related to project implementation and management.

(vi) *Training and Capacity Building*. Support to develop a training and capacity building plan for the WaSH PMU, followed by support for the implementation of the plan. It is expected that support for training and capacity building activities will be provided against an annually approved training and capacity building plan (as an indicative guideline, the cumulative expenditure for this activity should be below US$375,000), which may include activities such as targeted training, workshops, courses and study tours (including to countries with well performing WaSH sectors) for staff of the WaSH PMU.

(vii) *Project Implementation Manual*. Support to develop a specific Project Implementation Manual (PIM) for the implementation of Components 1 and 2. This will provide specific guidance to the WaSH PMU personnel on implementation arrangements, procedures and processes required for the implementation of the project (including financial management, procurement, monitoring and reporting, etc.). Project implementation arrangements, procedures and processes will follow and be integrated as much as possible with the existing requirements and processes of the implementing agencies. These will be augmented and/or modified for the project in areas where there are gaps with the Bank's policies and requirements.

(b) Support to the development and/or implementation of key sector tools.

(i) *Sector Management Information System (MIS)*. Support to help develop a sector MIS framework and roadmap, followed by support for the implementation of the roadmap.

(ii) *National WaSH Development Strategy*. The 5-year National WaSH Development strategy will among others include a realistic roll out plan for the National WaSH Policy over the next 5 years in rural and peri urban areas. The EU is providing short term technical assistance support, enabling the WaSH PMU to conduct advance work to begin preparing the strategy. The project expects to support further activities, taking into account the initial assessments and recommendations of the EU technical assistance, to support the finalization and adoption of the strategy by the WaSH PMU (with the endorsement of the WaSH Task Force) and the implementation of the roll-out plan during the project timeframe, including updates and adjustments as necessary.

(iii) *WaSH Communications and Promotions Plans*. Support for the implementation of the WaSH Communications and Promotions Plans, which is expected to be developed with the technical assistance from the EU during the first year of the project.

(iv) *WaSH Fund*. Support towards the development and establishment of a WaSH Fund as envisaged in the National WaSH Policy[16]. This is likely to include a

[16] The WaSH Fund, once established, is envisaged to provide the WaSH PMU a key tool to partner with DDAs to leverage for an increased pace of expansion of sustainable rural and peri-urban WSS. It is not meant to be the exclusive vehicle for financing rural and peri-urban WSS. Various channels of financing e.g., development partner

series of consultancies - to review and assess the possible options for the WaSH Fund, to carry out stakeholder consultations towards recommending a preferred option, to prepare the roadmap/steps towards setting up the Fund, and finally to develop the organizational structure, the operational procedures, and the legal instruments to set up the Fund.

(v) *Sector Regulatory Framework*. Support for the review of existing sector regulation (including economic and technical regulation) and the formulation of a sector regulatory framework.

8. **Component 2: Rural and Peri-urban Water and Sanitation**. This component will support the WaSH PMU to develop a framework for the coordination, planning and implementation of rural and peri-urban WSS in districts and in peri-urban areas. It is envisaged that the delivery of services will be through the sub-national authorities, in particular the new District Development Authorities (DDAs). The primary role of the WaSH PMU is thus to coordinate and provide a systematic national framework (including common policies, guidelines, financing frameworks and mechanisms, monitoring, regulations, etc.) and supporting the subnational authorities for rural and peri-urban WSS development and investments. Support towards building the national framework is addressed in Component 1. Component 2 activities will focus on supporting and building the capacity of the DDAs to plan, develop, implement and monitor rural WSS. District-wide systematic WaSH planning, development and monitoring is not yet practiced. This component will pilot the development of District WaSH Development Plans in up to four selected pilot districts. This will provide lessons on how the WaSH PMU could work through subnational authorities toward a systematic increase of access to services in districts. At the same time, the development of these plans provides the opportunity for building the capacity of DDAs in WaSH. Upon the successful development of district plans, selected investments in rural WSS based on these plans are expected to be undertaken. Component 2 is subdivided into: (a) a development planning and institutional strengthening subcomponent, and (b) an associated infrastructure investment subcomponent.

(a) Investment planning, design, and financing structures for rural and peri-urban WSS. This subcomponent will provide technical assistance, capacity building and other related support towards the planning, development and implementation of rural and/or peri-urban WSS programs by selected subnational government authorities.

(i) *Support to Pilot WaSH District Planning and DDA Capacity Building*. The retention of consultants (likely NGOs or other similar organizations already active in rural WSS efforts at the district levels) to provide support to DDAs in up to four selected districts to prepare district-wide WaSH Development Plans, including a prioritized rural (and/or peri-urban) WSS investment plan. It is expected that the pilot districts will be selected based on a call for expressions of interest and proposals from DDAs teaming up with a partner NGO to provide technical support. Once a pilot district is identified a contract will be offered to the partner NGO to provide technical assistance to support the

---

projects, or funding allocations by provincial, district or Lower level Governments (LLGs) through their budgets, will continue.

planning process. Once the district WaSH Development Plan is developed and approved, the same NGO is expected to be offered a contract to provide technical assistance to the district to implement selected investments based on the plan. The District WaSH Development Plan exercise is also an avenue to support the capacity building of the candidate DDAs towards WaSH planning, development and implementation.

It is expected that these four pilot activities will incorporate individual and joint review exercises, aimed at distilling lessons toward finding a common approach moving forward. These lessons will feed into the preparation of the Community Schemes Grant Implementation Manual (CSGIM) – see para. 8(a)(iv) below – that will be the basis for implementation as well as reference for further District WaSH Development Plans. The four pilot District WaSH Development Plan exercise are expected to be completed within the first two years of the project.

(ii) *Scaling up WaSH District Planning and DDA Capacity Building*. Subject to satisfactory implementation of the pilots, support for the preparation of District WaSH Development Plans will be scaled up, incorporating lessons and experiences from the pilots.

(iii) *Training and capacity building of provincial and district level implementation entities*. Support towards building the knowledge and capacity of WSS scheme implementing entities at the provincial and district levels, including provincial and district administration, NGOs and community organization. This may include promoting the principles and strategies of the National WaSH Policy, collecting and distributing materials on Gender Equality and Social Inclusion (GESI), developing and distributing technical manuals, producing sustainability guidelines, sharing best practices, and other training and knowledge sharing activities. It is expected that support for training and capacity building activities will be provided against an annually approved training and capacity building plan (as an indicative guideline, the cumulative expenditure for this activity should be below US$375,000) developed by the WaSH PMU in conjunction with supported districts and provinces. Besides the aforementioned activities, others may include targeted training, workshops, courses and study tours (including to countries with well performing WaSH sectors) for district and provincial staff.

(iv) *Community Schemes Grant Implementation Manual (CSGIM)*. Support to develop a specific CSGIM for the implementation of infrastructure investment in water and sanitation schemes in rural and/or peri-urban areas. This will provide specific implementation arrangements, procedures and processes required for the implementation of the rural and/or peri-urban schemes to be financed by the project (see below). The CSGIM will cover, amongst others, the process and criteria for selecting the schemes, and the procedures for financial and economic analysis, procurement, financial management, environmental and social safeguards, GESI, supervision, monitoring and

evaluation, consultations, and grievance redress mechanisms related to the schemes. The CSGIM will be prepared in parallel with the implementation of the pilot development of the district-wide WaSH Development Plans – see para. 8(a)(i) above – as it will need to reflect the agreed plans and methodologies of the Development Plans.

(b) Infrastructure investment in water and sanitation systems in rural and peri-urban areas. This subcomponent will support the implementation of rural WSS schemes selected from the District WaSH Development Plans developed under subcomponent 2(a)(i) and (ii) above. These schemes could include, among other things, the construction of rural and/or peri-urban water systems, hygiene and sanitation training, communication campaigns, and the associated facilitation and advisory support to communities. It is envisaged that for each District WaSH Development Plan, a number of schemes are chosen for project investments (based on the prioritized rural and peri-urban WSS investment plan). These project investments will be carried out through direct project grants to the communities or an implementation support entity (e.g., an NGO or Civil Society Organization)[17] and in accordance with the provisions of the Community Schemes Grant Implementation Manual (CSGIM)[18] per subcomponent 2(a)(iv) above.

The pilot District WaSH Development Plans will be the first attempts to carry out systematic development and investment planning for rural WSS coordinated at the district level through the DDAs, followed by community facilitation during implementation. While there are existing practices for the implementation of rural WSS schemes in PNG (typically using some form of community participatory approach), these have hitherto been fragmented, uncoordinated and largely unmonitored in the long run. The CSGIM would be expected to adopt some existing processes and procedures at the community level. It would also incorporate lessons learned from the pilot District WaSH Development Plans activities, particularly incorporating new processes and procedures developed in these pilots whereby rural WSS schemes within the district are planned and prioritized, facilitated, constructed and monitored at the district level. This is expected to include the processes and procedures with respect to roles that the DDAs will play e.g., monitoring functions.

Within a given village scheme itself, a typical arrangement would have the chosen community being technically assisted by an implementation support entity (e.g., an NGO or private contractor/entrepreneur) throughout the implementation cycle from planning to construction (frequently with the creation of local job opportunities), and establishing the arrangements for O&M of the facilities (including water quality monitoring). In particular, experience from current rural WSS schemes' practices have shown O&M through community management to be largely ineffective in the long run. The project will support the development of rural WSS scheme sustainability plans to be incorporated into the CSGIM (as also required by the National WaSH Policy).

[17] Grants will not be channeled through the DDAs.
[18] The Bank's acceptance of a satisfactory CSGIM will be a condition for disbursement for these schemes.

The implementation support entity will be contracted by DNPM. It is expected that the DDA (with continued support from the consultant/NGO hired to support the DDA under 2(a)(i) and 2(a)(ii) above) will continue to help oversee the implementation of rural WSS schemes in the district. Benefitting communities *may* be requested to contribute in cash or kind. The implementation support entity will help communities identify and choose the most appropriate feasible technical option(s) – usually from a menu of options (typical options in PNG are rainwater tanks, gravity fed systems and handpumps). The implementation support entity will help the communities make informed choices through wide discussions, including ensuring the participation of women in decision making. The implementation support entity will provide technical assistance and support for system design (including water quality assessments), construction and commissioning and operation. The implementation support entity will help the development of equitable institutional organizations within the village that are best able to manage, operate and maintain the facilities, including encouraging women's leadership and participation in management and user groups. The final detailed arrangements for village rural WSS schemes will be confirmed in the CSGIM.

9. **Component 3: Urban Water and Sanitation**. This component is focused on supporting the expansion of WSS services to urban areas, specifically in district and provincial towns where Water PNG has the mandate to provide these services. It is envisaged that a rolling program of design and investment support for new provincial and district town schemes would be carried out. Investment will commence with a first priority town scheme, which has been designed during project preparation, to test out and pave the way for a smooth rolling investment program. Given the water security and sustainability issues linked to climate change risks, optimal design for water conservation, energy efficiency, and source sustainability will be pursued. Other town schemes, to be identified from the pool of currently unserved district and provincial towns, will follow suit during implementation. This component will also support technical and financial improvements in Water PNG's existing operations. The existing operations would be assessed through technical audits and a program of technical and performance based improvements developed and implemented with project financing support. This will complement Water PNG's re-investment program to improve performance and extend the service of critical profitable existing systems. Last year, Water PNG budgeted and spent over US$ 7 million from their own self-generated resources on this program. This component will also support an assessment of Water PNG's existing operating model, in particular to identify potential future options to ensure continual financial viability as it expands service provision to new (and generally small and less profitable) district towns[19]. Component 3 is subdivided into: (a) an operational improvement and capacity building subcomponent, and (b) an associated infrastructure investment subcomponent.

(a) Operational improvement and capacity building of Water PNG. This subcomponent will provide technical assistance, capacity building and other performance improvement support to Water PNG.

[19] Water PNG's operating model should also need to take into account the provisions of the DDA Act (2014).

(i) *Review of Water PNG's service provision model in small towns*. The long-term sustainability of Water PNG's existing and future operations will be assessed and analyzed in detail, and options for alternative delivery models proposed. Currently, of the twenty existing Water PNG operational centers, 13 are loss making. The rest cross-subsidize the operations and maintenance requirements of the balance of the systems. As additional small district centers are constructed and added to the list of existing systems being operated and maintained by Water PNG, this model may come under strain in the future. An option might be to turn over the assets and O&M responsibilities for selected systems to the District and Provincial Administrations. Substantive analytical review and analysis is required to best determine the most optimal way forward in the urban water supply sector.

(ii) *Assessment of the rehabilitation requirements of the existing Water PNG's WSS systems*. A consultant is expected to be engaged to work closely with Water PNG staff in order to assess selected existing Water PNG water supply and wastewater systems. It is expected that the piping, storage reservoirs, mechanical components such as water treatment plants, chemical dosing mechanisms, and pumping stations, and electrical components will be assessed as to their existing conditions, maintenance and/or replacement requirements. Their remaining useful life will be estimated. Associated costs will be developed for these rehabilitation requirements, and these will be categorized into high, medium, and low priorities in order to better develop investment plans. In close consultation with the Water PNG management, consideration will be given to the possibility of placing the data for each system on a GIS platform in order to better track and update the assets registries and valuations as well as assisting in developing rational O&M plans based on real-time data. Water PNG's existing urban sanitation operations will also be candidates for assessment. This assessment expects to also incorporate relevant findings and recommendations from an ongoing EU-funded assessment of Water PNG's operations (including performing further assessments if necessary, and supporting the technical design of the improvement activities. Some priority rehabilitation recommendations are expected to be funded by the project (see 9(b)(b)(v) below). However, a key aim of these assessments support is to provide advice to Water PNG towards the optimal planning of its own substantial annual reinvestment program (as described in the general description of Component 3 in para. 9 of this Annex).

(iii) *Technical audit (including an energy audit) for the existing Water PNG's WSS systems*. In close coordination with the above rehabilitation requirements study (and possibly folded into it), a consultant will be engaged to assess ways and means of improving operational efficiencies of each of selected Water PNG existing water supply and wastewater systems. These will typically be actions and investments which can quickly yield reduced operating costs. Examples of these areas of "quick win" interventions would be in the assessment of the efficiency of the valve arrangements and operational procedures within WTP systems as well as the valve arrangements within the distribution network,

assessment of the electrical control panels and their operational functionality vis-à-vis controlling the operational efficiencies of motors, and therefore pumps, etc. Up to 15% - 20% of operational efficiency gains can be realized with minimal capital cost investments based on the recommendations of such a technical audit.

(iv) *Update of Water PNG's Design Manual*. The existing Water PNG Design Manual, which dates back to the early 1980s, will be updated. While still useful with respect to many of its technical aspects, many of the recommended standards are outdated. The most obvious examples supporting the need for a complete review and revision of the Design Manual would be factors such as the prescribed daily consumption figures, peaking factors, fire services requirements, etc. All of these, if not appropriately prescribed drive up the cost of the designs and leave behind an inefficiently designed water supply distribution network. If, for example, 10% of the overall cost a water supply system can be saved through the adoption of more appropriate standards, for every nine water supply systems invested in / constructed using these new standards (as compared with standards which are from a time when capital and operational costs efficiencies were not as much of a concern as they are in today's investment climate), one additional system could be constructed.

(v) *Technical Assistance*. This Component will support a range of individual consultancy services in the areas of infrastructure development planning, engineering, financial management, procurement (including specialists to advise on specific procurement evaluations, as necessary), environmental and social management, and project implementation and management.

(vi) *Training and Capacity Building*. Support to develop a training and capacity building plan for Water PNG, followed by support for the implementation of the plan. It is expected that support for training and capacity building activities will be provided against an annually approved training and capacity building plan (as an indicative guideline, the cumulative expenditure for this activity should be below US$375,000), which may include activities such as targeted training, workshops, courses and study tours for staff of Water PNG.

(vii) *Project Implementation Manual*. Support to develop a specific Project Implementation Manual (PIM) for the implementation of Component 3. This will provide specific guidance to the PMU-WPNG personnel on the implementation arrangements, procedures and processes required for the implementation of the project (including financial management, procurement, monitoring and reporting, etc.). Project implementation arrangements, procedures and processes will follow and be integrated as much as possible with the existing requirements and processes of the implementing agencies. These will be augmented and/or modified for the project in areas where there are gaps with the Bank's policies and requirements.

(b) Infrastructure investment in water and sanitation systems in selected District and /or Provincial Towns. This subcomponent will support infrastructure investments in selected district and provincial towns, including: (i) the construction and implementation of new water systems, and (ii) the rehabilitation, augmentation, extension and/or other improvements of existing WSS services. The associated activities to identify/select systems, conduct pre-feasibility and feasibility studies, detailed engineering design, prepare environmental and social safeguards instruments, and construction supervision will also be supported.

(i) *Preparation and design of water supply systems in district and provincial towns*. A consultant firm (or consultant firms) will be engaged to conduct necessary studies[20], prepare the detailed engineering designs, bills of quantity, engineer's cost estimates, construction grade drawings, and bidding documents for the construction of new, and rehabilitation of existing, water supply systems in selected district / provincial centers. Environmental and social safeguards instruments will also be prepared. This activity has been informed by the experience and lessons learnt from the preparation and design of the Bialla town water supply system, which was undertaken during project preparation.

Historically and typically, the design for provision of water supply in PNG has not taken water resources issues into consideration. This is given the historically ample rainfall and surface water sources in most parts of the country, excepting a few provinces. Under this project, the design of water supply systems will pay special attention to water security and conservation. The project's climate and disaster risk screening indicated significant risks of impact to water supply due to extreme precipitation and drought in the future. There is little systematic analytical work or information of the water resources situation in PNG. For the longer term, the Bank is pursuing to advance the water resources and water security dialogue in PNG. In the immediate term and at the project level, the project will seek to include the assessment of the security and sustainability of (local) water sources, and promote the conservation of water and energy resources, in water systems design. Specific consideration may include designs to minimize pumping requirements, the use of solar pumping technology where appropriate, assessment of the sustainability of water sources (including catchment protection), and considerations for diversified / backup water sources. These considerations will be included in the Terms of Reference of the design consultants.

(ii) *Construction supervision*. As per the World Bank operational procedures and guidelines, independent third-party engineering consultancy supervision of the construction activities are mandated. Construction supervision will include the supervision and monitoring of the adherence to project safeguards requirements (including the requirements of specific Limited ESIAs, EHS and other applicable instruments).

[20] Including preparation of financial and economic analysis, environmental, social and other required safeguards documents.

(iii) *Construction of water supply system in Bialla town*. Preparation and design for the Bialla town water supply system was completed by Water PNG during project preparation (using its internal funds). Project investment in urban water supply systems will commence with the Bialla system. Bialla is located in West New Britain Province and has a current estimated population of about 9,000 (2014), projected to increase to about 13,000 in 2034 (20 year planning horizon). The main economic activity revolves around oil palm. Currently, households and businesses rely mostly on rainwater harvesting, while some collect water from the nearest river (5 km distance). The Bialla secondary school and the Bialla health center use groundwater sourced from bore wells. The new Bialla water supply system will source water from these existing bore wells, and distribute it throughout the town using a typical small town water supply system consisting of water mains development, treatment process (if required), storage tanks at elevation and a gravity based distribution system.

(iv) Construction of water supply systems in other selected towns. It is estimated that about eight further water supply systems could be financed by the project, chosen from the pool of unserved district and provincial towns under Water PNG's service provision mandate. Out of these approximately 75 towns, the following towns are currently deemed by Water PNG to be priorities: Aitape, Angoram, Boana / Nawae Bogia, Bulolo, Henganofi, Ialibu, Kerema, Kerowagi, Kupiano, Lufa, Mendi, Minj, Misima, Namatanai, Nebilyer, Palmalmal, Pangia, Vanimo, Wapenamanda, Wau. A batch of towns will be chosen for investment financing based on Water PNG's priority and available financing envelope. The preparation and design for these systems will be supported by subcomponent 3.b (i) above.

(v) *Rehabilitation and retro-fitting of water supply systems for improved operational efficiencies*. Based on the technical and operational audits described in subcomponent 3.a (ii) and (iii) above, recommendations would be made to carry out activities to improve operational efficiencies in selected existing Water PNG operations. The priority areas of focus will be: (i) reduction of non-revenue water (NRW), (ii) reduction in operational costs, and (iii) improvement in water sales and revenue. Some rehabilitation of urban sanitation systems may be financed as prioritized by Water PNG.

10. **Component 4: Contingent Emergency Response (CER)**. This Component (initially with no allocated funding) will allow for the rapid reallocation of funds from other components to provide emergency relief, recovery and reconstruction support in the event of a natural disaster, emergency and/or catastrophic event. Funds potentially reallocated to Component 4 would be disbursed either against a positive list of critical goods and/or against the procurement of works, and consultant services required to support the immediate response and recovery needs. Implementation will be guided by a Contingent Emergency Response Implementation Plan (CERIP) to be developed in response to the emergency. The CERIP will include financial management, procurement, safeguards, monitoring and evaluation, and any other necessary implementation arrangements and procedures. One or more CERIPs may be developed

depending on the nature and the number of natural disaster, emergency and/or catastrophic events.

Annex 3: Implementation Arrangements

PAPUA NEW GUINEA
Water Supply and Sanitation Development Project

Project Institutional and Implementation Arrangements

1. The project will be implemented by the appropriate existing sector institutions in line with the National WaSH Policy.

2. **DNPM (through the WaSH PMU) will be the project implementation agency for Components 1 and 2, i.e., those related to the implementation of the National WaSH Policy and the provision of water supply and sanitation (WSS) services in rural and peri-urban areas**. The WaSH PMU will also be responsible for overall coordination of Components 1, 2 and 3 of the Project, sector coordination and policy implementation. DNPM has established the WaSH PMU which will undertake the implementation of these components. The WaSH PMU will be led by a WaSH Sector Coordinator and during its first year of operation will have a core minimum complement of at least three technical staff and 1 - 2 administrative staff. For project implementation purposes, the WaSH Sector Coordinator and the three core staff of the WaSH PMU should be satisfactory to the Bank. The project will support a full complement of technical assistance consultants to support the WaSH PMU team. These are expected to include technical assistance in, amongst others, rural WaSH, institutional and capacity development, monitoring and evaluation, communications, environmental and social safeguards, financial management and procurement.

3. While the WaSH PMU is the designated project preparation and implementation unit for the project, it also plays the main role in the implementation of the National WaSH Policy. Under this policy, the WaSH PMU is expected to be the initial entity charged with its implementation. The WaSH PMU would form the anchor agency for policy implementation, sector coordination and systemization, monitoring and capacity building. The WaSH PMU is expected to be later transformed into the National Water, Sanitation and Hygiene Authority (NWSHA). The strategy, detailed roadmap and timing for this transformation has not yet been defined. The EU is supporting the initial development of the WaSH PMU's organizational development plan with an ongoing Technical Assistance.

4. The WaSH PMU will be a new entity and initial capacity is expected to be weak. Apart from immediately strengthening the WaSH PMU with a minimum complement of specialist consultants to enable it to undertake the implementation and management of the project, an objective of the proposed project is to support its overall establishment and capacity strengthening, including activities toward its eventual transformation into the NWSHA. As such, Component 1 includes: (i) providing basic setup requirements such as equipment and other goods, facilities and if necessary limited operational cost support, (ii) supporting the development of strategies, sector development roadmaps, and various sector management instruments, such as the sector Management Information System (MIS), etc., and (iii) providing capacity building and training to increase staff knowledge and skills associated with sector policy and development.

5. **Water PNG will be the project implementation agency for Component 3, i.e., those related to the provision of water and sanitation services in district and provincial towns**. Water PNG has formed a dedicated Project Management Unit (PMU-WPNG). Similar arrangements were adopted by Water PNG for its previous donor funded projects. The PMU-WPNG is staffed by Water PNG personnel who are responsible for project implementation functions. For project implementation purposes, the staff of the PMU-WPNG should be satisfactory to the Bank. The personnel responsible for project implementation would include personnel from units of Water PNG relevant to project activities (infrastructure investments, utility management, financial management, procurement and contracts management, environment and social safeguards). Any gaps will be filled through external recruitment. The project will finance a complement of technical assistance consultants to support the PMU-WPNG. This may include technical assistance in engineering, monitoring and evaluation, communications, environmental and social safeguards, financial management and procurement.

6. Water PNG has been operating as a fully state-owned Commercial Statutory Authority since 1987 and has a track record in planning, designing, constructing, managing and commercially operating water supply and sewerage services in various provincial and district towns. Between 1994 and 2013, Water PNG has implemented about PGK 210 million (approx. US$80 million) of development projects, about PGK 120 million (approx. US$45 million) are donor/lender projects.

Financial Management, Disbursements and Procurement

Financial Management

7. The financial management (FM) assessment was carried out in accordance with the Bank's policy OP/BP 10.00 and in accordance with the "Principles Based Financial Management Practice Manual" effective March 1, 2010. The assessment concluded that the overall FM risk of the project is **Substantial**. Both the DNPM and the Water PNG have had experience in implementing other donor-funded projects, but no experience with Bank-financed projects. In relation to DNPM, the unit responsible for overseeing the project (WaSH PMU) has only recently been created and needs to be resourced. Overall the project may experience delays in gaining necessary approvals and in the timelines of submission of reports. There are also substantial infrastructure investments and grants at subnational level, operating in environments with low fiduciary capacity, and often in remote locations.

8. To mitigate the risks, technical assistance will be provided under the project to ensure that FM functions are performed and to provide advisory support. Dedicated project finance officers will be recruited, one for the WaSH PMU in DNPM and another for the PMU-WPNG. Training and capacity building will be provided by external consultants together with support from the Bank, including training on World Bank policies and procedures. FM procedures and systems will be integrated as much as possible with the existing requirements of the implementing agencies with clear and concise FM instructions prepared for project-specific aspects (to be detailed in the PIMs[21]) that are not covered elsewhere in the existing manuals, or policies and procedures. An adequate internal control framework will be maintained, including

[21] One PIM each for Components 1 and 2 under the WaSH PMU in DNPM, and for Component 3 under Water PNG, will be prepared. These are due to be prepared within 120 days of project Effectiveness.

internal controls over the infrastructure investments and grants (the latter to be detailed in a Community Schemes Grant Implementation Manual), and potential inclusion of Component 3 within the audit scope of Water PNG's existing internal audit function.

Implementing Entities and FM staffing

9. The implementing entities of the project are the Department of National Planning and Monitoring (DNPM) and Water PNG. A WaSH PMU will be established in the DNPM to assist DNPM to implement the project (Components 1 & 2) and similarly a PMU will be established in Water PNG to assist WPNG to implement the project (Component 3). An objective of the proposed project is to support the WaSH PMU's establishment and capacity strengthening, including the FM functions, and potential support for necessary equipment and incremental operating costs (subject to a cumulative ceiling) directly related to the project. Support for training and capacity building activities will be provided, together with implementation support from the Bank. Technical assistance will be provided to recruit a project Finance Officer, and to engage FM advisory support as necessary. The Finance Officer will perform the FM functions for the WaSH PMU which has responsibility for Components 1 and 2 of the project, including administering community grants. Additional FM resources will be considered as needed when the scale of project operations increases. DNPM staff will be nominated to initially cover the project FM-related tasks until the Finance Officer is appointed. There is a risk that this appointment may be delayed however low transaction volume and complexity is envisaged during the earlier stages. Water PNG has implemented donor/lender projects however they have not previously worked on World Bank-financed projects. For Component 3, the PMU-WPNG will be activated within the well-established Projects section of Water PNG, with existing staff to be assigned to the roles of Project Accountant and a combined Procurement/Finance position, together with an experienced FM advisor assigned by Water PNG to support the project. A dedicated project Finance Officer will be recruited under the project. The PMU-WPNG functions include managing the FM aspects of the infrastructure investments in District and Provincial towns. Training and capacity building will be provided to PMU-WPNG, including advisory support as necessary and initial and ongoing implementation support from the Bank. Water PNG will provide the equipment and other resources needed to operate the PMU-WPNG.

Budgeting Arrangements

10. Work plans will be developed, along with Procurement Plans, and annual training and capacity building plans for the respective components of the project being implemented by DNPM and Water PNG (including an initial pipeline of urban WSS subprojects for the latter). These plans will form the basis for the annual, and whole of project life, budgets which will be maintained on spreadsheets. The annual budget will then need to be entered into the DNPM and Water PNG accounting system to enable additional in year control and monitoring of payments against budget limits and ceilings, while actuals will need to be updated into the whole of project life budget spreadsheets to similarly track and monitor actuals against budget.

Accounting Arrangements

11. DNPM uses the Government of Papua New Guinea (GoPNG) IFMIS as its accounting system, however this only allows one general ledger account number for the project, therefore spreadsheets are required to provide additional breakdown, information, and monitoring and

reporting, including contract management. WPNG will use its accounting system, and use spreadsheets to provide any additional monitoring and reporting that cannot be achieved by its accounting system.

Internal Controls

12. Internal controls and payments will follow existing requirements of the implementing agencies and the PFMA and regulations. Clear and concise FM instructions will be prepared for project-specific aspects (as part of the PIMs) that are not covered elsewhere in the existing manuals, or policies and procedures issued by the Bank. Government payments in PNG are often subject to long delays mainly due to slow approvals, and regulatory requirements (such as foreign exchange controls and tax clearances). Where possible to avoid delays, approvals should be delegated within the implementing agency - subject to adequate segregation of duties and observance of the prevailing legal requirements. Due to the limited monitoring and reporting capabilities of the implementing agencies accounting systems, there will be a requirement for substantial use of spreadsheets, which are prone to error and require additional controls and review in order to ensure accuracy. Additional internal controls will need to be assessed to cover risks associated with the infrastructure investments in rural and peri-urban areas (Component 2) which will be detailed in the CSGIM. For Component 3, the existing internal audit function of Water PNG will be encouraged to include that project component within its internal audit scope, applying recognized standards, with appropriate capacity building and advisory support.

Flow of Funds

13. The WaSH PMU in DNPM and PMU-WPNG will each open a bank account in PGK, to receive World Bank funds into and act as the designated account (DA), at commercial banks acceptable to the Bank. The authorized signatories and other details of the DA will be contained in the Trust Instruments authorized by the Minister of Finance in accordance with the PNG government regulations. This process will need to commence as early as possible as long delays are often experienced in PNG with the signing of the Trust Instrument and opening of the DA. For Community sub-grants for rural WSS schemes, the procedures for the selection of investments, roles, bank account arrangements, tranches, financial management, controls and reporting etc., will be described in the CSGIM. The Manual will include details of documentation requirements/retention, and the level of oversight and support to be provided to the community.

Interim Financial Reporting

14. The WaSH PMU in DNPM and PMU-WPNG will each submit Interim financial reports (IFRs) quarterly to the Bank, which will including all sources of funds relating to their respective project components. These will be submitted not later than 45 days after the end of each calendar quarter. The IFR format will be agreed with the Bank and will include total project receipts (reconciled to the Bank's Client Connections system) and payments for the period (including year-to-date and cumulative figures), together with evidence that the IFR closing balance reconciles with the cashbook and to the bank account. Delays in the submission of IFRs are often experienced in PNG and adequate controls (management oversight, checks and reconciliations, templates etc.) with clear instructions are to be included in the PIM.

Annual financial statements & External Audit

15. Separate project annual financial statements for the DNPM and WPNG project components, will be required in a format acceptable to the Bank, to be audited under the oversight of the PNG Auditor General's office (AGO), and submitted to the Bank no later than six months after the end of the audit period.

16. The Auditor General signs all project audit opinions, however the AGO may contract the audit to a private audit firm in which case the fee of the private audit firm may be funded by the project provided Bank procurement guidelines are observed. The audited project financial statements will be required to be published by the implementing agency in accordance with the Bank's Access to Information Policy. Technical assistance may be provided to assist with project financial statement preparation, including for PMU-WPNG, training in the application of internationally-accepted financial reporting standards.

Disbursements

17. Eligible expenditures will be funded 100% from project finances (inclusive of taxes) and must be productive and reasonable to achieve the project development outcomes. The project will use four Disbursement Methods: Advance, Reimbursement, Direct Payment, and Special Commitment. Direct payments to suppliers and consultants will be utilized to the extent possible so as to expedite payment of eligible expenditures incurred under the project. It is anticipated that Special Commitments will only be used rarely (in the case of imported goods). The minimum value of applications level for direct payment and reimbursement, as well as the required documentation and DA ceiling, is set out in the Disbursement Letter. Advances cannot be replenished until such time as evidence is provided that the advanced funds have been expended. Government's counterpart funds of $7.3 million will finance the cost of DNPM staff and Water PNG staff assigned to implement the project, their associated overhead and operational costs.

Category	Allocated Credit Amounts (expressed in USD)	Percentage of Expenditures to be financed (inclusive of taxes)
(1) Goods, non-consulting services, Consultants' services, and Training under Component 1 and Component 2(a) of the project	7,850,000	100%
(2) Incremental Operating Costs under Components 1 and 2(a) of the project	500,000	100%
(3) Grants* under Component 2(b) of the project	10,000,000	100%
(4) Goods, non-consulting services, consultants' services, and Training under Component 3 of the project	6,150,000	100%
(5) Works under Component 3 of the project	45,500,000	100%
(6) Emergency Expenditures under Component 4 of the project	0	100%
TOTAL AMOUNT	**70,000,000**	

***** *A satisfactory Community Schemes Grant Implementation Manual (CSGIM) will be a condition for disbursement*

18. **Retroactive Financing**. The Credit will provide for retroactive financing to facilitate the financing of expenditures on activities under Categories (1) and (2) in the financing table above, paid before the signing of the Financing Agreement. Eligibility for retroactive financing is subject to several conditions, among others: (i) adherence to the relevant procurement guidelines, (ii) the payments must be made on or after July 1, 2016, and (iii) adherence to documentation requirements for expenditure claim under retroactive financing, which are the same as those for disbursement against payments made after the Financing Agreement is signed. Provision for this retroactive financing up to US$500,000 will be made in the project Financing Agreement.

Procurement

19. The procurement capacity assessments of Water PNG and DNPM concluded that the overall procurement risk of the project is **Substantial**, and identified the following main risks: (i) Inefficiency due to potential excessively long period between identification of procurement need to contract signature; (ii) Delay to project implementation due to limited procurement capacity and resources; and (iii) Delay to project implementation due to constraints in the contractors' capacity. Key mitigation measures include: (i) Water PNG staff to be trained on Kumul Consolidated Holdings (KCH) approval processes and DNPM staff to be trained on CSTB approval processes; (ii) Implementing agencies to develop Key Performance Indicators to monitor procurement activities; and (iii) procurement expertise to be included within the implementing units to be established.

20. The following measures that have also been recommended are summarized below:

Water PNG	
Key risks	**Mitigation Actions**
Most contracts are likely to exceed the PGK 5 million threshold and there is the risk of inefficiency due to potential excessively long period between advertising to contract signature.	i. Water PNG to revise its procurement manual so that the approval processes are clear (Water PNG may wish to add a work flow). ii. Water PNG to adopt a procurement management database (such as the Bank's STEP) and develop KPIs to monitor procurement activities. Water PNG should aim to carry out the evaluation and award of contract within 60 days (90 days is usual maximum period). iii. Water PNG staff to be trained on KCH approval processes. iv. Water PNG to clear the standard bidding documents to be used in the project with KCH's legal department.
Delay to project implementation.	i. Implementing Unit to be established will include procurement expertise.
Delay to project implementation due to constraints in contractors' capacity.	i. Contractors' survey, which should identify potential contractors and their capacity to carry out the works planned under the project. (The results of this survey should be taken into account by Water PNG for the purposes of procurement plan so that attractive packaging is prepared)
Lack of past and future opportunities cause difficulties for Contractors to plan. Lack of public oversight may lead to abuse and	i. Water PNG to implement "open contracting" practices. I.e. to disclose procurement plans, procurement notices, contract awards and contract progress on its website. ii. Water PNG to undertake annual Business Opportunities Seminars (BOS)

Water PNG	
Key risks	**Mitigation Actions**
corruption.	
While Water PNG's policies accepts "Donor Rules", such provisions may be incorrectly applied, which could lead to improper implementation of procurement activities under the project.	i. Presentation (video conference) comparing main features of Water PNG's and World Bank's procurement policies.
Several legal provisions do not conform to World Bank's policy regarding NCB	i. Inclusion of Special Procedures for National Competitive Bidding into the project's Financing Agreement.

DNPM	
Key risks	**Mitigation Actions**
Most contracts are likely to exceed the PGK 0.5 million threshold and there is the risk of inefficiency due to potential excessively long period between advertising to contract signature.	i. DNPM to adopt a procurement management database (such as the Bank's STEP) and develop KPIs to monitor procurement activities. DNPM should aim to carry out the evaluation and award of contract within 60 days (90 days is usual maximum period). ii. DNPM staff to be trained by CSTB on approval processes. iii. DNPM to clear the standard bidding documents to be used in the project with CSTB.
Delay to project implementation.	i. Implementing Unit to be established will include procurement expertise.
Lack of past and future opportunities cause difficulties for Contractors to plan. Lack of public oversight may lead to abuse and corruption.	i. DNPM to implement "open contracting" practices. I.e. to disclose procurement plans, procurement notices, contract awards and contract progress on its website. ii. DNPM to undertake annual Business Opportunities Seminars (BOS) and target potential Consulting Services.
Several legal provisions do not conform to World Bank's policy regarding NCB.	i. Inclusion of Special Procedures for National Competitive Bidding into the project's Financing Agreement.

21. Procurement for the project would be carried out in accordance with the World Bank's Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits dated January 2011 (Revised July 2014; and Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers dated January 2011 (Revised July 2014), as well as the specific provisions stipulated in the Legal Agreements.

22. **Procurement of Works**: Works estimated to cost US$5,000,000 or less will be procured through National Competitive Bidding (NCB). Water PNG has a Standard Bidding Document (WPNG Standard Bidding Document for Water Works) acceptable for IDA. Small value works

less than US$1,000,000 may be procured through Shopping. Procurement to be carried out by Water PNG will primarily entail civil works for urban WSS. The bidding documents for the water scheme in the District town of Bialla (approximately US$2.5 million) have been prepared. The civil works expected to be procured under the project in the first 12 months is shown below.

1	2	3	4	5	6	7	8	9
Ref. No.	**Contract (Description)**	**Est. Cost (US$)**	**Proc. Method**	**P-Q**	**Domestic Preference (yes/no)**	**Review by Bank (Prior / Post)**	**Expected Bid-Opening Date**	**Comments**
WPNG W1	Water Supply System Bialla	2,500,000	NCB	No	No	Prior	Jan 6, 2017	

23. **Procurement of Goods and Non-consulting services**: Most goods relate to off-the-shelf goods and non-consulting services relate to small site-related services such as drilling and mapping services. These are mostly of small value of less than US$500,000 and may be procured through Shopping. Direct Contracting may be used, but only in exceptional circumstances as stated in paragraph 3.7 of the Procurement Guidelines. The goods to be procured under the project in the first 12 months are shown below.

1	2	3	4	5	6	7	8	9
Ref. No.	**Contract (Description)**	**Est. Cost (US$)**	**Proc. Method**	**P-Q**	**Domestic Preference (yes/no)**	**Review by Bank (Prior / Post)**	**Expected Bid-Opening Date**	**Comments**
DNPM G1	Office equipment / furniture	10,000	Shopping	No	No	Prior	Feb 15, 2017	
DNPM G2	Vehicle	50,000	Shopping	No	No	Prior	Feb 15, 2017	
DNPM G3	Implementation of WaSH Communication Plan	100,000	Shopping	No	No	Post	Feb 15, 2017	

24. **Selection of Consultant Firms**: Consulting contracts expected to cost more than US$500,000 equivalent per contract would use the Quality and Cost Based Selection (QCBS) or Quality Based Selection (QBS) in conformity with the Consultants Guidelines. Consulting services estimated under US$500,000 equivalent per contract may follow the Selection Based on Consultants Qualifications (CQS). The Least-Cost Selection (LCS) would be used for simple assignments such as audit services. Under the circumstances described in paragraph 3.9 of the Consultants Guidelines, consultants may be selected and awarded on a Single-Source Selection (SSS), subject to the Bank‘s prior approval. Individual consultants will be selected and contracts awarded in accordance with the provisions of paragraphs 5.1 through 5.5 of the Consultants Guidelines. Under the circumstances described in paragraph 5.6 of the Consultants Guidelines, individual consultants may be selected and awarded on a Single-Source basis, subject to the Bank‘s prior approval. The consultant services to be procured under the project in the first 12 months are shown below:

1	2	3	4	5	6	7
Ref. No.	**Description of Assignment**	**Estimated Cost (US$)**	**Selection Method**	**Review by IDA (Prior / Post)**	**Expected Proposals Submission Date**	**Comments**
DNPM C.1	Support to WaSH Coordinator	130,000	IC	Prior	Mar 3, 2017	
DNPM C.2	Preparation of Project Implementation Manual	40,000	IC	Prior	Mar 3, 2017	
DNPM C.3	Preparation of Community Grants Manual	40,000	IC	Post	Mar 3, 2017	
DNPM C.4	WaSH Institutional advisor	40,000	IC	Post	Dec 8, 2017	
DNPM C.5	Monitoring & Evaluation advisor	75,000	IC	Post	Mar 3, 2017	
DNPM C.6	Financial management advisor	40,000	IC	Post	Mar 3, 2017	
DNPM C.7	Procurement and contracts advisor	40,000	IC	Prior	Mar 3, 2017	
DNPM C.8	WaSH Engineer.	30,000	IC	Post	Aug 24, 2017	
DNPM C.9	Preparation and Implementation of Sector Management Information System (MIS)	500,000	QCBS	Prior	Jun 4, 2017	
DNPM C.10	Preparation and Implementation of Pilot District WaSH Development Plans (4 nos)	800,000	CQS	Prior	Mar 3, 2017	
DNPM C.11	Advisory support for Sector Regulatory Framework	500,000	QCBS	Prior	Jul 5, 2017	
DNPM C.12	Establishment of a WaSH Fund	500,000	QCBS	Prior	Dec 5, 2017	
WPNG C.1	Engineering construction supervision services for Bialla	313,000	SSS	Prior	Jan 6, 2017	
WPNG C.2	Engineering design and supervision of water supply systems in remaining towns (7 nos)	3,102,500	QCBS	Prior	Feb 1, 2017	
WPNG C.3	Technical assessment of the rehabilitation and energy savings requirements of the existing 20 Water PNG's WSS systems	300,000	CQS	Post	Mar 4, 2017	
WPNG C.4	Review of Water PNG's service provision model in small towns	200,000	CQS	Post	Apr 4, 2017	
WPNG C.5	Update of Water PNG's Standard Design Manual	50,000	IC	Prior	Feb 1, 2017	
WPNG C.6	Finance Officer	72,000	IC	Prior	Feb 4, 2017	
WPNG C.7	Procurement / Contracts Management Specialist	96,000	IC	Post	Feb 4, 2017	
WPNG C.8	Environmental Engineer - Safeguards focal point	72,000	IC	Post	Feb 4, 2017	
WPNG C.9	Civil Engineer	72,000	IC	Post	Feb 4, 2017	
WPNG C.10	Electrical and Mechanical Engineer	48,000	IC	Post	Feb 4, 2017	
WPNG C.11	Communications Specialist	72,000	IC	Post	Feb 4, 2017	
WPNG C.12	Project Implementation Manual (Component 3)	50,000	IC	Post	Feb 4, 2017	

25. **Grants for community rural WSS schemes.** In a process to be described in a Community Schemes Grant Implementation Manual (CSGIM), DNPM would retain implementation support entities to implement the rural WSS schemes to be financed by the

project. This will likely be done through a call for expressions of interest for grant funding proposals and with the assistance of a small Technical Advisory Committee constituted by DNPM, eligible proposals would be identified.

26. Eligible expenditures would include small civil works, labor, goods/equipment and materials for community hygiene and sanitation training, communication campaigns, and the associated facilitation and advisory support to communities. It's therefore not possible to pre-identify items to be procured for the rural WSS schemes at this stage. The total cost of each proposal is likely to vary, but they are not expected to be in the range of US$75,000 – US$100,000 per scheme. In addition, schemes above US$200,000 are not anticipated.

27. Procurement for eligible activities under approved rural WSS schemes would be carried out using the Community Participation in Procurement method (as per para 3.19 of the Procurement Guidelines).

28. The following procurement practices are recommended to be used for procurement under approved proposals of selected rural WSS scheme.

(a) *Goods*. For small goods contracts (US$10,000 or less equivalent per contract), Direct Contracting may be used provided that the price is reasonable. For goods costing US$200,000 or less equivalent per contract, Shopping would normally be used. Larger goods contracts may be procured using Open Competitive Bidding procedures (similar to the national competitive bidding).

(b) *Civil Works*. For small works contracts (US$50,000 or less equivalent per contract), Direct Contracting may be used provided that the price is reasonable. For works costing US$200,000 or less equivalent per contract, Shopping would normally be used. Larger works contracts may be procured using Open Competitive Bidding procedures (similar to the national competitive bidding).

(c) *Consulting Services*. For small contracts (US$100,000 or less equivalent), single source selection (but usually based on a comparison of qualifications of several candidates or previous experience with the firm) would be used (to a certain extent, this procedure is similar to the Bank's CQS method). For larger contracts, consultants would be selected through a competitive process similar to the Bank's QCBS or LCS methods.

29. The procurement practice for each activity will be specified in the proposals. The DNPM will monitor the adherence to the approved proposals by the implementation support entities.

30. All contracts financed in whole or in part by the project and procured under the sub-grant arrangements shall be subject to post-review by the Bank.

31. **Procurement Prior Review Thresholds**. At Appraisal the "Original Project Procurement Risk Rating" is Substantial. Procurement Decisions subject to Prior Review by the Bank as stated in Appendix 1 to the Guidelines for Procurement of Goods, Works & Non-Consulting Services as well as Appendix 1 to the Guidelines for the Selection & Employment of Consultants:

Procurement Methods	Procurement Prior Review Thresholds	Comments
I. Goods:		
	>US$500,000	First two (2) procurement activities
Direct Contracting	Meet the criteria set out in para. 3.7 of Procurement Guidelines	All contracts subject to prior review
II. Works:		
	>US$2, 000,000	First two (2) procurement activities
III. Community Participation in Procurement		
Community participation in procurement would be used for Community Service Delivery Grants.		
IV. Selection of Consultants:		
Selection Methods	**Procurement Prior Review Thresholds**	**Comments**
Firms	>$500,000	All for Direct Contracting (Single-Source Selection) + first two (2) procurement activities
Individual Consultants	>$300,000	all legal and procurement consultant assignments regardless of value + first two (2) procurement activities

32. **Procurement Plans**. The overall procurement plans for the project will be agreed and finalized by negotiations. These will be available on the Water PNG and DNPM websites and on the Bank's external website. The procurement plans will be updated in agreement with the Bank at least annually, or as required, by including contracts previously awarded and to be procured in the next period to be covered by the updated procurement plan.

Environmental and Social (including safeguards)

33. The ESMF and Limited ESIA for Bialla were prepared by a competent consultant team retained and supervised by Water PNG. These have been publicly disclosed on April 7, 2016. The Bank team provided technical guidance to the development of the Terms of References (TORs) and supervision of the consultants. It is expected that Water PNG will prepare the Limited ESIAs for other subprojects in district and/or provincial towns chosen for project financing in parallel with the detailed design, utilizing the design consultant. The scope for the

preparation of the safeguards instruments will be included in the TORs for the design consultants, and will be based on the TORs for Bialla. The Limited ESIAs for rural water and sanitation subprojects chosen for project financing are expected to form part of the scope of work of the consultants (likely NGOs) supporting the preparation of the district WaSH Development plans in selected districts. Rural water and sanitation supply supported by the project are expected to be very small, consisting mainly of either (i) gravity-based piped water schemes supplying water to several villages / communities with community shared water points; or (ii) rain harvesting tanks at the household or groups of households' level. The Bank will review all limited ESIAs and related documents, prior to their finalization and disclosure.

34. Both Water PNG and the WaSH PMU in DNPM have no previous experience of implementing Bank infrastructure projects. Water PNG has implemented projects financed by other development partners, notably the Asian Development Bank (ADB) and has had the experience of carrying out Baseline Environmental Studies and Environmental Impact Assessments (EIA) as required by the Environment Act since 2000. Nevertheless, both implementing agencies' capacities to prepare and implement project safeguards instruments are expected to be weak. The project will support technical assistance in the form of specialist individual consultants to augment both the Water PNG and WaSH PMU project implementation teams.

35. The Bank team has assessed the capacity and track record of Water PNG with respect to water quality monitoring to be satisfactory. Water PNG has a track record of operating water supply (it was established in 1986 as the Waterboard). Water PNG performs regular and systematic sampling and monitoring of water quality in all its operations, as required by the authorities. All sampling and analytical work is performed by a NISIT (National Institute of Standard and Industrial Technology) registered laboratory. The PNG drinking water quality code of practice and the World Health Organization (WHO) Drinking Water Quality Guidelines are the basis for Water PNG Water's water quality operations and monitoring.

Monitoring & Evaluation

36. At the project level, the results framework forms the basis to track the progress of activities and their outcomes towards meeting the project objectives. The WaSH PMU and Water PNG will submit to the Bank quarterly reports that would provide an overview of the progress made and highlight issues that need attention. The project will provide both project implementation entities with technical assistance to support reporting, monitoring and evaluation, environmental and social safeguards audits and construction supervision.

37. At the broader sector level, a key aim and activity to be supported by the project is the development of a sector Management Information System (MIS) framework and roadmap, followed by support for the implementation of the roadmap. The sector MIS is expected to be rolled out in stages. While the sector MIS system itself is not a necessity for adequate project monitoring, when in place it can serve as a secondary data source and provide sector status and background information.

38. Implementation oversight will be provided by the WaSH Task Force. The multi-stakeholder WaSH Task Force, which oversaw the development of the National WaSH Policy

will be tasked, amongst others, as the steering committee of the WaSH PMU during the policy implementation stage. Through its periodic monthly meetings, the WaSH Task Force will provide the oversight over the WaSH PMU workplans and overall directions of the implementation of the National WaSH Policy. The WaSH Task Force is uniquely positioned to provide this higher level oversight particularly due to its broad representation amongst the water sector stakeholders. The WaSH Task Force includes representatives from DNPM, the Department of Treasury, Department of Health, Department of Implementation and Rural Development, Department of Provincial and Local Level Government Affairs, Department of Environment and Conservation, Department of Education, Department for Community Development and Religion, Department of Works, Kumul Consolidated Holdings, Water PNG, Eda Ranu, World Health Organization, UNICEF, the European Union and WaterAid. It also has the mandate to include additional representative(s) from the NGO sector and request additional specific technical assistance as required.

39. Additional oversight on Water PNG will be provided through Kumul Consolidated Holdings (KCH). As the shareholder and regulator of State-Owned Enterprises (SOEs), KCH will play an oversight role of Water PNG's overall operational and financial viability.

Role of Partners

40. The project is not co-financed by a donor partner. However, various development partners are active in the water and sanitation sector in PNG, and a number have or plan to have active operations in the sector in support of the common objectives of increasing access to water and sanitation in alignment to, and in support of, the National WaSH Policy. Dialogues and interactions with these donor partners that have been undertaken during project preparation and are expected to continue during project implementation, with a view towards coordinating activities and encouraging common approaches between development partners. Key development partners active in the sector in PNG include the European Union, the Asian Development Bank (ADB), the Government of Australia, UNICEF and the Japan International Cooperation Agency.

Annex 4: Implementation Support Plan

PAPUA NEW GUINEA
Water Supply and Sanitation Development Project

Strategy and Approach for Implementation Support

1. **Risk minimization through design**. The strategy for implementation support is based on the design of the project and its identified risk profile. During project preparation, considerable efforts have been made to identify key risks. Key project design decisions were made in order to reduce risks going into project implementation. These include limiting the project scope[22], utilizing project conditions and covenants to ensure minimum risks control measures, alignment with the National WaSH Policy and adopting a careful sequencing of activities implementation to a manageable pace, focusing on institutional strengthening (particularly for the new WaSH PMU) and demonstrating implementation processes and approaches (many of which are new, particularly for the WaSH PMU).

2. **Risks during Implementation**. Notwithstanding these risk minimization and mitigation measures in project design, significant residual risks will remain during implementation, in particular stemming from: (i) new sector and implementation institution, especially the WaSH PMU, (ii) new and untested implementation institutional arrangements, (iii) potential implementing agencies' unfamiliarity with the Bank's social and environmental safeguards practices, and (iv) the uncertainties with respect to the sustainability of project outcomes. The Bank's implementation oversight activities will need to meet the Bank's own fiduciary obligations. In addition, the Bank's implementation support approach will focus on providing technical support to the implementing agencies to support their efforts to (i) successfully carry out the project activities, (ii) meet the fiduciary, environmental and social safeguards compliance requirements of PNG and the Bank, and (iii) strengthen their institutional capacities as part of the overall efforts in the implementation of the National WaSH Policy.

Implementation Support Plan

3. The implementation support approach includes the following:

(a) **Technical Guidance and Supervision**. The focus of engineering implementation support will be on (i) working closely with the implementing agencies and their supervision consultants to review and provide technical advice on designs and specifications (including the normal reviews of bidding documents), (ii) working closely with the implementing agencies and their supervision consultant to review ongoing technical assistance and physical works and provide advice on technical issues arising.

(b) **Safeguards**. The Bank's supervision team includes an environmental safeguards specialist. The specialist will lead the safeguards supervision and monitoring of the project. Specific specialists will be drawn in on a short term as-needed basis.

[22] While ensuring that at the sectoral level the scope remains adequate to enable a successful implementation of the National WaSH Policy and to begin addressing the priority towards increasing access to water supply and sanitation services by including manageable infrastructure investments in selected towns and rural districts.

The Bank team will supervise implementation of the social and environmental management instruments and provide guidance to the WaSH PMU and Water PNG to address any issues. Technical supervision will include review of Water PNG's quality monitoring records during our normal supervision, and take mitigating actions in the event quality issues are detected.

(c) **Fiduciary**. Bank FM supervision will generally be conducted by on-site visits in PNG, at least twice a year or as the needs arise, based on the risk assessment of the project. The supervision objective is to ensure that financial management systems are adequately maintained throughout the life of the project. The supervision will include a review of overall operation of the FM system, including transaction-testing and other areas deemed necessary during supervision. Capacity building needs will be assessed on an ongoing basis, and addressed in collaboration with the implementing agency and project management. In addition to the prior-review to be carried out by IDA, IDA procurement supervision missions will visit the field to carry out post-review of procurement activities every 12 months. The post review sampling ratio will be 20% of contracts.

Focus of Implementation Support

Time	Focus	Skills Needed	Resource Estimate	Partner Role
Year 1 - 2	• Sector institutional setup • Institutional capacity building • Development of Sector Policy, M&E, WaSH Fund • Design of towns water schemes • Technical and procurement reviews • Consultancy and construction supervision • Fiduciary (FM and procurement) training • Safeguards training • Mid-term review (MTR) at end of Year 2	• Sector technical specialist (policy, institutional, regulations and engineering) • Procurement • Financial Management • Safeguards	Supervision Budget	Consultation and feedback for MTR Coordination for common approaches
Year 3 - 5	• Institutional capacity building • Implementation of Sector Policy, M&E, WaSH Fund • Consultancy and construction supervision	• Sector technical specialist (policy, institutional, regulations and engineering) • Procurement • Financial Management • Safeguards	Supervision Budget	Coordination for common approaches
Closing	• Drawing lessons learnt, and mainstreaming of good practices	• Monitoring and Evaluation • Sector technical specialist (policy, institutional, regulations and engineering)	Supervision Budget	Consultation and feedback for ICR

Skills Mix Required

Skills Needed	Number of Staff Weeks (per year)	Number of Trips (per year)	Comments
Task Team Leader	6	2	Based in Region
Co-Task Team Leader	6	2	Based in Region
Infrastructure officer / specialist	12	NA	Based in CO
Sector policy and institutional specialist	6	2	International expert
Water and sanitation engineer	6	2	International expert
Environmental Specialist	2	2	Based in Region
Social (including Indigenous people) specialist	2	2	Based in Region
Financial Management specialist	3	2	Based in Region
Procurement specialist	3	2	Based in Region
Communications specialist	2	1	Based in Region
Operational support	12	NA	Based in CO

Annex 5: Economic and Financial Analysis

PAPUA NEW GUINEA
Water Supply and Sanitation Development Project

General Methodology

1. Financial and economic analysis was conducted at appraisal. Benefits and costs were identified and quantified as much as possible. Data availability is extremely limited on the ground; there are no systematic data collection and monitoring being carried out in the water sector. The WaSH PMU is the first national agency to be established with the mandate to be responsible for the overall management framework for the sector. The Management Information System (MIS) proposed to be developed with the project support under Component 1 represents the first attempt to systematically collect and monitor sector-wide information in PNG. As such, technical data forming the basis for financial and economic analysis is severely lacking.

2. The institutional development and strengthening activities under Components 1 and 2 of the project are akin to a technical assistance project. These technical assistance cannot be reliably quantified and attributed to the project. The rural water supply investments proposed under Component 2 are not yet identified and initial activities will be pilots. Given these circumstances, specific numerical economic and financial analysis of Components 1 and 2 was not proposed during appraisal. However, financial and economic analysis will be carried out during implementation once rural water supply investments are identified and confirmed.

3. Component 3 represents about 70% of the total project. For the infrastructure investments in Component 3 where specific potential subprojects with adequate data can be identified, numerical cost – benefit analysis was applied. Analyses focused on: (a) the overall financial position of Water PNG as a utility, and (b) project economic and financial analysis. As Water PNG is an existing enterprise, an incremental analysis was adopted.

4. Component 3 is expected to finance the construction of up to nine water supply systems in district and provincial towns under Water PNG's service provision mandate that are currently not served. Bialla town water supply system has been identified as the first water supply system to be constructed under the project. About eight other town water supply systems will be identified, designed and implemented under the project, out of around 75 towns under Water PNG's service provision mandate that are not yet serviced. Economic and financial analysis was carried out for the identified Bialla town water supply system. The technical parameters, which are the basis for the economic and financial analysis were already defined. Technical data is also available for a potential water supply system in Bulolo and thus economic and financial analysis was also carried out for the Bulolo water supply system. Financial and economic analysis will be carried out during implementation for the other town water supply systems once investments are identified and confirmed.

5. Assumptions for the computation of benefits were based on available primary and secondary information. Data would need to be collected during implementation to assess actual benefits and costs of these two water supply systems as well as those of the other towns after they are confirmed. Preparation for this is underway. Establishing a rigorous monitoring and

evaluation system would be useful to keep track not only of Water PNG's financial performance, but also of the benefits accruing from the water supply systems supported by the project.

Operation and Financial Position of Water PNG

6. Water PNG is a state-owned enterprise with a track record of implementing water supply and sanitation (WSS) projects, including those supported by development partners. It is a profitable company, and is financially and commercially well regulated by the Independent Consumer and Competition Commission (ICCC), PNG's economic regulator and consumer watchdog. There are regular tariff adjustments. Consequently, Water PNG has the capability to generate modest internal cash to be utilized for reinvestment. Its reinvestment program from self-generated resources to improve performance and extend the services of critical systems amounted to about US$ 7 million in 2015. The total income of the utility is more than sufficient to cover fixed and variable costs. On average, water income makes up 86% of total revenue. However, its business model is based on a cross-subsidy mechanism between towns. As of December 2015, 13 of the 20 operations were operating at a loss. This is not an issue in the immediate foreseeable future (especially with efficient governance of Water PNG's Board and regulation from ICCC). But Water PNG should need to review its business model for the longer term as it looks to expand its operations into smaller district towns, which are under its mandate for service provision.

Box A5.1: Summary Water PNG's Operational Performance

Water PNG currently has 20 operating water supply systems (several with sewerage systems as well). In 2013-2014, Water PNG registered an average annual water production of 12,902,440 m^3. Water production has increased at a rate of 14%. However, 10 water supply systems showed decreased production in the same period. Water production shows seasonal variability. Peak time of production is around February and then it gradually goes down until December.

As of December 2015, the total number of connections was 27,104. The average number of connections per water supply system was 1,433. Four water supply systems have less than 120 connections. Residential users make up 88% of the total connections. Industrial, commercial and institutional users make up 6%, 2% and 4% respectively. In terms of usage, residential users consume 41% of total sales. Industrial, commercial and institutional users consume 21%, 9% and 30% respectively. Residential users who are in the unplanned residential areas have the lowest consumption of 72 liters per capita per day (lcpd). This is relatively lower compared with the World Health Organization's (WHO) standard for piped water of 100 lcpd. Domestic low covenant residential users consume an estimated amount of 121 lcpd, while domestic high covenant user consume 180 lcpd.

The average annual water sales during the 2013- 2014 period were reported at 8,759,752 m^3. Nine of the 20 business centers (water supply systems) have shown decreased sales over the same period, and a decrease is likely in 2015 considering the sales pattern in the first half of 2015. Overall Non-Revenue Water (NRW) is relatively high, averaging at 35% due to pipe leakages and illegal connections. This translates to about PGK 17,426,226 of foregone revenues per year. Each percentage reduction in NRW could potentially save around PGK 0.5 million in revenue.

In 2015, the ICCC set a new tariff regime, which effectively increased minimum water consumption from 12 to 20 m^3 and decreased the price for this minimum level of water consumption from PGK1.3 per m^3 to PGK0.3 per m^3. Under the new tariff regime, sales revenues are expected to decrease starting 2016. Water PNG has shown 35% increase in revenue collection from 2013 to 2014. In June 2015, collection is reported at PGK 42,058,509 or 52% of the previous year's level. While not an immediate threat to Water PNG, revenue for 2015 and 2016 is expected to be under pressure until a more balanced tariff adjustment is implemented. Water PNG is in the process of discussing with the ICCC with a view

of rebalancing the tariff regime in the next tariff adjustment.

Project Financial Analysis

7. **Investment and Operating Parameters**. The following are the basic assumptions:

a. The capital expenditure (CAPEX) requirements for Bulolo and Bialla: PGK 10,606,000 and PGK 9,090,000. CAPEX include civil works, equipment and physical contingency. Land required for water supply infrastructure is expected to be Government owned and is assumed to have no financial cost to Water PNG. CAPEX amount includes goods and service taxes of 10%.

b. Construction period spans 2 years, with operations assumed to start in Year 3. The project's operational life is assumed to be 20 years.

c. CAPEX will all be financed by grant funds from the Government through this project.

d. O&M costs per connection per year are assumed to be PGK1,420. This is based on Water PNG 2013-2015 financial data for water supply systems that are of the same size as Bulolo and Bialla. Historical growth of O&M costs based on financial data is 2 percent. But, this analysis assumes that O&M costs will increase by inflation rate of 6%. Components of O&M costs are salaries and wages, chemical and other supplies, repairs and maintenance, among others.

e. Bulolo has a total household population of 20,865 (Census of Population 2011). The initial number of household connections is 536, which represents 5% of the total household population or 25% of the urban household population of 2,147. For Bialla, the initial number of household connections is 506, which is 3% of the total household population of 10,283 (Census of Population 2011). Household connections are expected to increase at rate of 5% per year.

f. Production capacities of the water supply systems are yet to be determined and confirmed. Water revenues are therefore computed based on historical average consumption per type of water and average price of water per type of user.

g. The demand structure in terms of household connections is assumed to follow the existing demand structure of Water PNG. Water demand is assumed to be largely residential (88%). Industrial, commercial, and institutional demand share 6%, 2% and 4%, respectively.

h. The average consumption per connection per month (in m^3) is also assumed to follow current consumption patter by type of water user: residential (46.7), industrial (183.4), commercial (120.8), and institutional (390.4).

i. The average price of water per m^3based on historical financial data of Water PNG is as follows: residential (3.2), industrial (4.8), commercial (4.7) and institutional (5.0). Water price is assumed to increase by 2% per year.

j. Collection efficiency for billed water is assumed to be constant at 94% throughout the project life. This means that that 4% of annual sales is accounts receivable.

k. Water PNG is exempt of income tax payments.

Results

8. Financial indicators point to very modest project financial viability.

Viability Indicators	Bulolo	Bialla
FNPV (PGK)	2,251,339	2,824,227
FIRR (%)	2%	2%

9. To improve financial viability, Water PNG would need to take the following critical factors into account during implementation:

a. Initial household connections. Water PNG will have to be more aggressive in connecting households within the first three years of operation. It would need to achieve the assumed level of connections to be financially viable. If the initial number of water connections significantly fall below this level while other assumptions remain the same, the water systems would no longer be financially viable and will need cross-subsidy from other operations.

b. Expansion in terms of connection and increases in tariff by at least by the level of inflation could also improve financial viability.

c. Collection efficiency should be enhanced to improve revenue flows.

d. Water PNG should ensure that unaccounted-for-water will not increase over time or will be averted under the project. System losses converted into real revenues would be beneficial.

e. A 10% increase in CAPEX still shows modest viability. However, a 10% increase in O&M costs will make the project not financial viable. Thus, Water PNG should also monitor O&M costs and make sure that it only increases with inflation.

Project Economic Analysis

10. **Quantifiable Economic Benefits**. The economic benefits consists of:

a. Increased water consumption (incremental water) due to improved water services and accessibility. This can be computed in terms of the additional amount of water consumed under the project multiplied by the average price of water. Since residential users mainly account for water demand, the analysis assumes that the

average amount of water consumed per month is 21.5 m^3. This is within the range of what water PNG considers as basic minimum consumption (20 m^3). This also yields around 100 liters per capita per day. The average demand price with and without piped water is computed at PGK13.2.

b. Resource cost savings on the non-incremental water consumed in switching from alternative water supply (e.g., wells, standpipes, vendors, others) to the new piped water supply system resulting from the project. This is estimated by multiplying the quantity of water consumed without the project (non-incremental quantity) by the average price in with and without the project situation. The average water consumption without piped water connection is 4.3 m^3per household per month. This is the higher estimate based on WSP Study on Sanitation, Water Supply and Hygiene in Urban Settlements in Papua New Guinea (2014). The average price without connection based on the above WSP study is PGk22.2 per m^3.

c. Time saved from collecting water. The WSP study noted that in off- premises, water collection could take 5 to 30 minutes. The estimated time saved per household is 0.5 hours per day based on WSP 2014 study. This is consistent with WHO global estimate of 0.5 to 1 hour per household. However, the analysis assumes more conservative estimate of 15 minutes of time saved. The WSP study also estimates that the average household income covered by its survey is PGK 400 per fortnight (15 days) or PGK 800 per month. The analysis only assumed 50 percent of the estimate to be conservative.

11. **Quantifiable Costs**. Quantifiable costs included capital investment costs and O&M costs.

12. Due to very limited information, only capital investment costs are adjusted for tax distortions. Adjustments in costs and prices to account for distortions in labor and foreign exchange were not applied. The capital investments are assumed to be fully depreciated by the end of the operational life of the water supply systems.

13. The social discount rate is assumed to be 12%.

14. **Other Benefits Not Quantified**. The following are some benefits of water supply, but were not quantified due to limited availability of data on the ground and/or benefits could not be quantified:

a. *Public health benefits*. Based on studies, there has been compelling evidence that significant health impacts are associated with improvements in access to safe drinking and improved sanitation. The economic benefits related to health impacts of improved WSS services include: (a) savings associated with reduced incidence of water- related morbidity such as diarrhea, typhoid, etc.; (b) savings related to productive time losses from water-related diseases; and (c) savings related to reductions in premature mortality. Data is currently unavailable, but this is expected to be included in the sector MIS system that will be developed under the project.

b. *Benefits to women*. Women and girls of school age generally assume the burden of water collection in Papua New Guinea. The WSP 2014 study noted that off-premises

water collection generally takes between 5 and 30 minutes. In the dry season water collection typically takes two hours, but may go up to four or five hours for some households due to distance and waiting time. Women manually carry water between the collection point and their home. Thus, they make multiple trips to satisfy the water needs of their households. For young girls, this would mean not being able to go to school. Women also collect water late at night to avoid long queues putting them at risk of violence. Moreover, women are carrying heavy loads of water of around 20- 30 kilograms at a time, and this may have negative impact on their long-term health. The project would relieve women and girls of school age of this heavy and time-consuming work.

Results

15. Results show that the proposed water supply systems in Bulolo and Bialla have high economic rate of returns (EIRR) and economic net present value (ENPV), indicating evident combination of direct benefits, resource cost savings and time savings.

Viability Indicators	Bulolo	Bialla
ENPV (PGK)	11,490,701	11,216,300
EIRR (%)	26%	28%

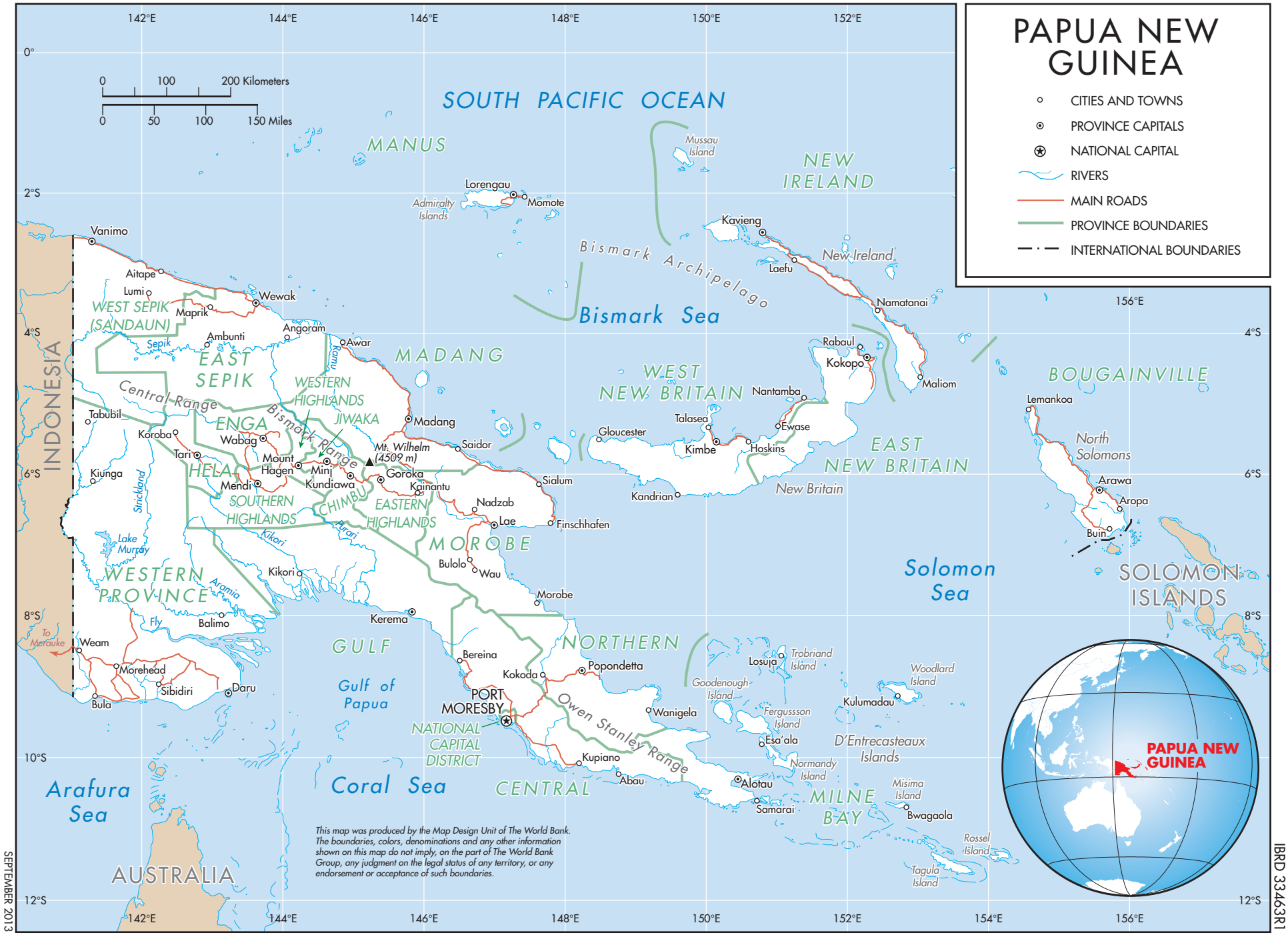
Sensitivity Analysis

16. Sensitivity analysis was conducted considering four major scenarios: (a) 10% increase in capital costs, (b) 10% increase in O&M, (c) 10% decrease in benefits, and (d) 10% increase in total cost and 10% decrease in benefits. The results remain robust.

Scenarios	Bialla		Bulolo	
	ENPV (PGK)	EIRR	ENPV (PGK)	EIRR
Base Case	11,490,701	26%	11,216,300	24%
10% increase in capital cost	9,661,733.05	24%	6,105,123.07	20%
10% increase in operations and maintenance (O&M)	9,905,999.77	25%	6,310,979.54	21%
10% decrease in benefits	6,844,650.37	22%	4,220,654.06	19%
10% total cost and 10%decrease in benefits	4,791,204.67	18%	1,946,004.99	15%

Affordability Analysis

17. Water and sanitation services must be affordable and should not create an adverse impact on households' ability to pay for basic needs such as food, clothing and housing, among others. Affordability can be assessed by considering the percentage of household income spent on water and sanitation services. International recommendations determining the threshold for water expenditures are in the range of 3 to 5 percent of household monthly income of the lowest income group. Assessment of affordability at project preparation has not been feasible because data on household income and expenditures was not available.


PAPUA NEW GUINEA
CITIES AND TOWNS
PROVINCE CAPITALS
NATIONAL CAPITAL
RIVERS
MAIN ROADS
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
SOUTH PACIFIC OCEAN
Bismark Sea
Solomon Sea
Coral Sea
Arafura Sea
Gulf of Papua
Bismark Archipelago
INDONESIA
AUSTRALIA
SOLOMON ISLANDS
MANUS
NEW IRELAND
MADANG
WEST NEW BRITAIN
EAST NEW BRITAIN
BOUGAINVILLE
WEST SEPIK (SANDAUN)
EAST SEPIK
WESTERN HIGHLANDS
ENGA
JIWAKA
HELA
SOUTHERN HIGHLANDS
CHIMBU
EASTERN HIGHLANDS
MOROBE
WESTERN PROVINCE
GULF
NORTHERN
CENTRAL
MILNE BAY
NATIONAL CAPITAL DISTRICT
PORT MORESBY
Central Range
Bismarck Range
Owen Stanley Range
Mt. Wilhelm (4509 m)
Admiralty Islands
New Ireland
New Britain
North Solomons
D'Entrecasteaux Islands
Trobriand Island
Woodlard Island
Goodenough Island
Fergussson Island
Normandy Island
Misima Island
Rossel Island
Tagula Island
Lake Murray
Strickland
Sepik
Ramu
Aramia
Fly
Kikori
Purari
Vanimo
Aitape
Lumi
Wewak
Maprik
Ambunti
Angoram
Awar
Tabubil
Koroba
Wabag
Tari
Mount Hagen
Minj
Kundiawa
Goroka
Kainantu
Madang
Saidor
Sialum
Nadzab
Lae
Finschhafen
Kiunga
Mendi
Kikori
Bulolo
Wau
Morobe
Kerema
Balimo
Weam
To Merauke
Morehead
Sibidiri
Daru
Bula
Bereina
Kokoda
Popondetta
Wanigela
Kupiano
Abau
Alotau
Samarai
Losuia
Kulumadau
Esa'ala
Bwagaola
Lorengau
Momote
Mussau Island
Kavieng
Laefu
Namatanai
Rabaul
Kokopo
Maliom
Nantamba
Talasea
Ewase
Gloucester
Kimbe
Hoskins
Kandrian
Lemankoa
Arawa
Aropa
Buin
0 100 200 Kilometers
0 50 100 150 Miles
142°E
144°E
146°E
148°E
150°E
152°E
154°E
156°E
0°
2°S
4°S
6°S
8°S
10°S
12°S
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
SEPTEMBER 2013
IBRD 33463R1