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Report No: PADHI00381

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED GRANT

IN THE AMOUNT OF SDR 14.9 MILLION
(US$20.05 MILLION EQUIVALENT)

TO THE

INDEPENDENT STATE OF SAMOA

FOR A

DIGITALLY CONNECTED AND RESILIENT SAMOA PROJECT
(P180807)

SEPTEMBER 26, 2024

Digital Development
East Asia And Pacific

CURRENCY EQUIVALENTS

(Exchange Rate Effective {August 31, 2024})

Currency Unit =	SAMOAN TALA (SAT)
SAT 2.7027 =	US$1
US$1.3466 =	SDR 1

FISCAL YEAR
July 1 - June 30

Regional Vice President:	Manuela V. Ferro
Regional Director:	Sudeshna Ghosh Banerjee
Country Director:	Stephen N. Ndegwa
Practice Manager:	Mahesh Uttamchandani
Task Team Leader(s):	Shivnesh Roynendra Prasad, Ji Eun Choi

ABBREVIATIONS AND ACRONYMS

ACMD	Aid Coordination and Management Division
AM	Accountability Mechanism
CBR	Correspondent Banking Relationships
CSL	Computer Services Ltd
CTSSU	Centralized Technical Services Support Unit
DA	Designated Account
EAP	East Asia and Pacific
ESCP	Environmental Social Commitment Plan
ESF	Environmental and Social Framework
FM	Financial Management
FTTP	Fiber-to-the-premises
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNI	Gross National Income
GoS	Government of Samoa
GRS	Grievance Redress Service
IA	Implementing Agency
ICT	Information and Communications Technology
IDA	International Development Association
IPF	Investment Project Financing
ITU	International Telecommunication Union
IXP	Internet Exchange Point
M&E	Monitoring and Evaluation
Mbps	Megabits per second
MCIT	Ministry of Communications & Information Technology
MOF	Ministry of Finance
NDC	Nationally Determined Contribution
NDID	National Digital Identity
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OoTR	Office of the Regulator
PCM	Private Capital Mobilization
PDO	Project Development Objective
PDS	Pathway for the Development of Samoa
PICs	Pacific Island Countries
PPP	Public-Private Partnerships
RPF	Regional Partnership Framework
SamCERT	Samoa National Computer Emergency Response Team
SFSRD	Samoa Finance Sector Resilience and Development
SNBH	Samoa National Broadband Highway
SPL	Samoa Post Limited
SPOF	Single point of failure

SSCC	Samoa Submarine Cable Company Limited
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
TOR	Terms of Reference
WB	World Bank

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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Samoa	Digitally Connected and Resilient Samoa Project		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P180807	Investment Project Financing (IPF)	Moderate	

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[✓] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternative Procurement Arrangements (APA)	[ ] Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
18-Oct-2024	30-Oct-2029
Bank/IFC Collaboration	
No	

Proposed Development Objective(s)

To increase resilient, and inclusive use, of broadband internet and enhancing delivery of digitally enabled services

Components

Component Name	Cost (US$)
Component 1. Digital Connectivity and Digital Government Infrastructure	15,390,000.00
Component 2. Strengthening and enhancing the enabling environment for the digital transformation	3,750,000.00
Component 3. Project implementation support	910,000.00

Organizations

Borrower:	INDEPENDENT STATE OF SAMOA
Contact:	Sao'leititi Maeva Betham-Vaai
Title:	CEO
Telephone No:	68534333
Email:	Maeva.BethamVaai@mof.gov.ws
Implementing Agency:	Ministry of Communications & Information Technology
Contact:	Lefaoalii Unutoa Auelua-Fonoti
Title:	Chief Executive Officer
Telephone No:	68526117
Email:	u.auelua-fonoti@mcit.gov.ws
Implementing Agency:	Office of the Regulator
Contact:	Lematua Gisa Fuatai Purcell
Title:	CEO and Regulator
Telephone No:	68530282
Email:	regulator@regulator.gov.ws

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)?	Yes
Is this project Private Capital Enabling (PCE)?	No

SUMMARY

Total Operation Cost	**20.05**
Total Financing	**20.05**
of which IBRD/IDA	**20.05**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Development Association (IDA)	20.05
IDA Grant	20.05

IDA Resources (US$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
National Performance-Based Allocations (PBA)	0.00	20.05	0.00	0.00	20.05
Total	**0.00**	**20.05**	**0.00**	**0.00**	**20.05**

Expected Disbursements (US$, Millions)

WB Fiscal Year	2025	2026	2027	2028	2029	2030
Annual	1.50	3.50	7.00	4.00	3.50	0.55
Cumulative	1.50	5.00	12.00	16.00	19.50	20.05

PRACTICE AREA(S)

Practice Area (Lead)

Digital Development

Contributing Practice Areas

CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Moderate
9. Overall	Substantial

POLICY COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Currently Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description
The Recipient shall establish and thereafter maintain, throughout the Project implementation period, the ICT Sector Advisory Committee, with a mandate, composition and resources satisfactory to the Association. (Section. I.A.1 of Schedule 2 to the Financing Agreement)
The Recipient shall vest responsibility for implementation of: (a) Parts 1, 2.1, 2.2(b) and (c), 2.3 and Part 3 of the Project in the MCIT; and (b) Part 2.2(a) of the Project in the OoTR, all in accordance this Agreement and the Project Operations Manual. (Section. I.A.2 of Schedule 2 to the Financing Agreement)
The Recipient shall maintain, throughout the Project implementation period, within MOF, a CTSSU, with a mandate, composition and resources satisfactory to the Association. (Section. I.A.4 of Schedule 2 to the Financing Agreement)
The Recipient shall establish, by no later than three (3) months after the Effective Date, and thereafter maintain throughout the Project implementation period, a Sector Coordination Division ("SCD") within MCIT, with a mandate, composition and resources satisfactory to the Association, which shall be responsible for Project implementation. (Section. I.A.5 of Schedule 2 to the Financing Agreement)
The Recipient shall maintain, throughout the Project implementation period, a core team within OoTR, with a mandate, composition and resources satisfactory to the Association, which shall be: (i) responsible for, inter alia: day-to-day implementation, reporting and monitoring and evaluation of Part 2.2(a) of the Project; and (ii) comprised of qualified

and experienced OoTR staff with technical expertise relevant to the implementation of the Project. (Section. I.A.6 of Schedule 2 to the Financing Agreement)
The Recipient shall establish and thereafter maintain, throughout the Project implementation period, the ICT Working Group, with a mandate, composition, and resources satisfactory to the Association, which shall: (i) be responsible for, inter alia, providing technical support to MCIT; assisting MCIT and OoTR in defining technical requirements and providing technical inputs for the Project; and coordinating and collaborating with external consultants for the Project to facilitate requirements and other documentary procedures that may be necessary; and (ii) comprise of representatives from across Government agencies. (Section. I.A.7 of Schedule 2 to the Financing Agreement)
The Recipient shall prepare and adopt, by no later than three (3) months after the Effective Date (or such other date as may be agreed with the Association), a Project operations manual, in form and substance satisfactory to the Association, containing detailed arrangements and procedures for institutional arrangements for day to day execution of the Project. (Section I.B.1 of Schedule 2 of the Financing Agreement
The Recipient shall, prior to commencing activities under Part 1.1 of the Project, adopt an annex to the POM, detailing the modality and procedures for PPP transactions financed under Part 2.1 of the Project ("PPP Annex"), on terms and conditions acceptable to the Association. (Section. I.C.1(a) of Schedule 2 to the Financing Agreement)
The Recipient shall enter into a legally binding arrangement with a private partner or partners, selected on a non-discriminatory basis in accordance with the criteria and requirements set forth in the PPP Annex, and, if applicable, on a competitive basis according to the Procurement Regulations, for the rollout and delivery of high-quality, low-cost digital infrastructure and services under Part 1.1 of the Project ("PPP Arrangements). (Section. I.C.2 of Schedule 2 to the Financing Agreement)
The Recipient shall prepare and furnish to the Association, by not later than June 30 of each year during the implementation of the Project (or such other interval or date as the Association may agree), for the Association's review and approval, an Annual Work Plan and Budget (Section. I.D.1 of Schedule 2 to the Financing Agreement)
The Recipient shall prepare and adopt, by no later than eighteen (18) months after the Effective Date (or such other date as may be agreed with the Association), a Sustainable Asset Management Mechanism, in form and substance acceptable to the Association, setting forth arrangements for the sustainability of infrastructure and services developed under the Project, including Parts 1.1 and 1.3 of the Project (Section. IV of Schedule 2 to the Financing Agreement)

Conditions

Type	Citation	Description	Financing Source

I. STRATEGIC CONTEXT

A. Country Context

1. **Samoa, a lower-middle income country in south-central Pacific Ocean in the Polynesian region, faces a number of challenges for economic growth.** The border closure and restriction on economic activities due to the COVID-19 pandemic affected local businesses with spillover effects into other sectors, resulting in a real GDP decline of 15 percent cumulatively over fiscal years 2020-2022. In 2022, GDP per capita was US$3,743, approximately 10 percent lower than that just four years prior, in 2018 (US$4,189).[1] After the reopening of the country to tourism, the economy grew by 8.0 percent in 2023, but growth is expected to taper off to around 2.3 percent in FY2027-28. In 2018, more than one-fifth of the population lived under the basic-needs poverty line (21.9 percent), approximately 3 percentage points higher than the poverty rate in 2013-14 (18.8 percent).[2]

2. **Samoa's small population and geographic remoteness pose challenges for achieving economic diversification unless barriers to access digital solutions are addressed.** Due to its small population of 207,473 people (2022), Samoa relies heavily on external trade, foreign investment, and fiscal aid for economic growth. This makes the country vulnerable to external shocks. High-speed internet, e-commerce, digital payments, and other emerging technologies can help Samoa overcome the tyranny of distance and connect to global value chains. Investing in green technologies to power the digital economy can make Samoa more attractive for foreign direct investments. However, the absence of reliable internet especially in rural areas and weak government capacity to provide public services to citizens and businesses digitally are critical barriers needs to be addressed for full realization of Samoa's growth potential facilitated through digital transformation.

3. **Samoa is also highly vulnerable to climate change and experiences natural disasters once every five years on average.** Resilience is a key priority of the Government of Samoa (GoS), with prominence given to ex-ante investments in resilient infrastructure. Enhanced resilience also safeguards sustainable growth and economic diversification. Under a very high emissions scenario Samoa is expected to experience an increase in temperature in the range of 0.5-1.1 ^{o}C by 2030.[3] In addition, rise in sea level is projected to be in the range of 7 percent by 2030, ocean surges will affect low-altitude coastal plains during storms and cyclones.[4] The compounding effects of sea level rise, heightened frequency of extreme rainfall, escalating intensity of cyclones, and ocean acidification will increase Samoa's vulnerability, significantly affecting livelihoods and security. In the capital city of Apia, a cyclone with a 100-year return period, or with a 50 percent chance of occurring within the current generation, could likely inflict damage equivalent to 60 percent of GDP.[5] With 70% of the population living in low-lying coastal areas, the country's infrastructure is highly vulnerable to natural disasters[6]. A lack of reliable digital connectivity and secure data centers worsens the situation because in the case of disaster, alerting and helping the citizens become more challenging without digital infrastructure.

[1] International Monetary Fund Article iv. 2023; World Development Indicators. GDP per capita (current US$)
[2] Samoa Poverty and Hardship Report 2023
[3] https://www.mnre.gov.ws/wp-content/uploads/2021/03/Samoa-Climate-Change-Policy-2020-2030.pdf
[4] Samoa Climate Change Policy 2020 [r]
[5] https://climateknowledgeportal.worldbank.org/country/samoa/vulnerability
[6] https://www.adaptation-undp.org/explore/polynesia/samoa

4. **The Samoan economy is largely dependent on tourism and a substantial portion of its population is engaged in agriculture and fisheries, which are intricately linked to changes in the environment.** Any changes in the natural environment such as coral bleaching, loss in biodiversity, and decline in fish species, will significantly strain sustainable economic growth and well-being of Samoa's citizens. With 70 percent of the population living in low-lying coastal areas, the country's infrastructure is highly vulnerable to natural disasters. Therefore, the physical investment of the Project will include both climate change adaptation measures to increase resilience and reduce vulnerability, and mitigation measures to improve efficiency and reliability of the network.

B. Sectoral and Institutional Context

5. **Samoa has led the Pacific region in telecommunications (telecom) sector reform, implementing comprehensive changes.** In 2005, the *Telecommunications Act 2005* introduced competition, established essential regulatory frameworks, and created the Office of the Regulator (OoTR) for oversight. The World Bank provided crucial support for these reforms through a US$4.48 million development credit, [7] which contributed to Samoa in achieving one of the highest mobile phone coverage rates in the Pacific region. Today, the telecom market is driven by two major operators: Digicel Samoa is owned by Australia's Telstra, while Vodafone Samoa is owned by Amalgamated Telecom Holding Limited of Fiji.

6. **The GoS has demonstrated a strong commitment to advancing the nation's digital infrastructure through strategic investments and policy initiatives**. The GoS has been a major supporter and contributor to the development of the digital infrastructure in Samoa, through investments in foundational connectivity infrastructure such as the *Tui-Samoa submarine cable system* and the development of the *Samoa National Broadband Highway* (SNBH).[8]

7. **Strategic investments in international connectivity, such as the *Tui-Samoa* submarine cable system project, have significantly expanded Samoa's bandwidth, positioning the country for future digital growth.** Valued at US$41.76 million**,** the *Tui-Samoa* submarine cable system project successfully leveraged private and public sector financing and expertise. The public sector contribution was co-financed by multiple partners including the World Bank, Asian Development Bank, Government of Australia and GoS.[9] Samoa's international bandwidth increased from 250 megabits per second (Mbps) to 14,000 Mbps between 2015 and 2022. The Samoa Submarine Cable Company Limited (SSCC), established in 2015, manages this submarine cable system. This investment proved essential during the COVID-19 pandemic, supporting a substantial increase in data usage.[10]

8. **The GoS has implemented policy and legislative initiatives to support digital advancement and infrastructure development.** In 2024, the government passed the National Digital Identification Act, paving the way for a

[7] Telecommunications and Postal Sector Reform Project (P075739). Project closed 02/28/2011 and the outcome was rated as moderately satisfactory.
[8] Samoa National Broadband Highway is the Government's private intranet network connecting critical Government agencies within Apia.
[9] For more details, see Pacific Regional Connectivity Program: Phase 3 – Samoa (P128904). The US$41.76 million project was co-financed by a US$16 million IDA grant from the World Bank, US$18.5 million from the Asian Development Bank, US$1.5 million from the Government of Australia, and US$5.76 million from the Government of Samoa.
[10] SSCC was established in April 2015 by the Government of Samoa and six founding shareholders: Samoa National Provident Fund (SNPF), Unit Trust of Samoa (UToS), Samoa Life Assurance Corporation (SLAC), Bluesky Samoa Ltd (BSL), Computer Services Ltd (CSL), and Digicel Samoa Ltd (DSL).

National Digital ID (NDID) system. This initiative is supported by the proposed World Bank-financed *Samoa Finance Sector Resilience and Development* (SFSRD) project (P181456), which aims to strengthen Samoa's financial supervision, payment, and identification systems. The success of SFSRD is closely tied to the infrastructure upgrades and expansions proposed by this Project, as improved internet connectivity and data infrastructure are essential for the effective use of the NDID system and the modernization of the payment system.

9. **Samoa's strong growth in mobile broadband adoption sets a solid foundation for the next phase of digital development.** Samoa has seen rapid growth in mobile broadband adoption, reaching 48 percent population penetration in March 2024 and recovering from the drop in take-up caused by the COVID-19.[11] This success can be attributed to the effective market reforms and competition in the mobile sector. Further, according to GoS, around 98 percent of the population have 4G (fourth generation wireless) mobile broadband coverage, providing a significant portion of the population in the urban areas with access to digital services and mobile broadband connectivity.

10. **While mobile broadband has flourished, the limited adoption of fixed broadband presents a significant area for further investment and economic growth.** Fixed broadband uptake remains low, with household subscriptions at just 5.9 percent—far below the regional average of 56 percent.[12] This limitation acts as a significant barrier to expanding broadband services, creating a bottleneck for the information and communications technology (ICT) industry and hindering the full realization of the digital economy's potential.

11. **The high cost of fixed broadband relative to income levels presents a clear target for intervention to boost digital adoption and economic participation.** The cost of fixed broadband relative to gross national income (GNI) per capita in Samoa is prohibitively high at 15.1 percent, well above the International Telecommunication Union (ITU) affordability target of 2 percent GNI per capita.[13] For instance, the lowest entry-level fixed broadband plan in Samoa costs approximately US$55 per month, while in Fiji, it is about US$24. This high cost presents a barrier to adoption, particularly for lower-income households and micro and small businesses.

12. **Expanding fixed fiber infrastructure beyond Apia– in Upolu and in Savai'i – is crucial for delivering consistent, high-quality digital services across Samoa, particularly in rural areas.** Currently, only 30 percent[14] of the cell towers in Samoa are connected by fiber, primarily around the central Apia area, while the rest rely on microwave links. This results in variable service quality, especially in rural areas in Upolu and in Savai'i. Out of 51 Districts in Samoa, OoTR identifies 47 as unserved or underserved, where more than 60 percent of the population resides. [15]

13. **As reliance on digital services grows in Samoa, so does the need for robust cybersecurity measures to protect its digital economy and citizens.** The global cost of cybercrime is projected to increase from US$11.50 trillion to more than US$23 trillion between 2023 and 2027. Globally, in the first quarter of 2023, the education, research,

[11] TeleGeography, GlobalComms Database, Samoa, March 2024.
[12] TeleGeography, GlobalComms Database, Samoa, March 2024.
[13] Broadband Commission for Sustainable Development, 2025 Broadband Advocacy Targets, https://www.broadbandcommission.org/advocacy-targets/2-affordability/.
[14] Based on update by MCIT during preparation
[15] Based on 2021 census data on population by location from the Samoa Bureau of Statistics and MCIT's list provided to the World Bank on underserved and/or unserved areas.

government, defense, and healthcare sectors—all priority areas for GoS—were among the most targeted.[16] While comprehensive cybersecurity statistics for Samoa are limited, the rise in cyberattacks aligns with regional trends, and GoS's data networks and storage solutions require enhanced cybersecurity measures.

14. **Samoa has taken important initial steps to enhance its cybersecurity posture, laying the groundwork for more comprehensive measures.** The country developed its first National Cybersecurity Strategy in 2016 and inaugurated the National Computer Emergency Response Team (SamCERT) in 2021. SamCERT's primary role is to promote cybersecurity awareness and provide basic services, and it is working to enhance the resilience of critical infrastructure and digital platforms. In May 2024, GoS approved a new *Information Security Policy* to protect government processes and data. However, Samoa still lacks specific legislation on critical infrastructure protection, which is crucial for building trust in the digital economy.

15. **With a significant portion of the population active on social media, addressing online safety is crucial for Samoa's digital well-being.** With an estimated 132,000 active social media users, Samoa has seen increased risks of cyberbullying, [17] identity theft, and online exploitation, especially affecting young females. Studies indicate high rates of bullying, with around 79 percent of males and 70 percent of females experiencing it. Women tend to report higher rates of emotional victimization. [18] In response, initiatives like the Samoa Cyber Smart Roadshow in 2023 have focused on promoting cyber hygiene and online safety in schools and communities.

16. **Replacing the government's outdated digital infrastructure presents an opportunity to improve public service delivery and efficiency.** SNBH, which functions as the government's intranet connecting more than 27 ministries, agencies, schools, and hospitals within Apia, has become outdated. Launched in 2014, the SNBH has been serving as critical infrastructure enabling various government agencies to connect to a central, "closed" network. However, the SNBH equipment is at its end of life and needs to be replaced. The government plans to continue owning and operating its dedicated intranet network. Similarly, existing government data is fragmented across multiple data centers which suffer from frequent electricity outages, capacity and security constraints, necessitating replacement.

17. **Climate and disaster resilience of digital infrastructure is a key consideration for future investments**. Given Samoa's vulnerability to natural disasters and climate change impacts, it is crucial that new digital infrastructure investments incorporate appropriate resilience and redundancy features[19]. This would ensure robust and secure communications, particularly during emergencies and climate-related events.

18. **Overall, Samoa's current digital landscape presents several strategic investment opportunities to enhance connectivity, improve government services, and foster inclusive economic growth.** The limited coverage and penetration of fixed broadband services, particularly of fiber infrastructure, presents an investment opportunity to expand broadband access and fully realize the potential of the digital transformation. Fiber broadband supports

[16] Check Point Software Technologies Ltd. (2023). "Global Cyberattacks Continue to Rise with Africa and APAC Suffering Most." April 27.
[17] https://datareportal.com/reports/digital-2022-samoa; and Biswas, T. et all. (2020).
[18] See Hishinuma, E. S., Chang, J. Y., Goebert, D. A., Helm, S., Else, I. R., & Sugimoto-Matsuda, J. J. (2015)
[19] There were incidents of power outages following heavy rainfall, that exposed digital network and adversely impact business continuity of digital services during the high intensity atmospheric events https://samoaglobalnews.com/upolu-power-outage-epc-working-to-restore-electricity-into-homes-as-rain-pours-down/

higher bandwidth connections, is more reliable and is generally considered a more future-proof access technology than mobile broadband. Investing in fiber broadband infrastructure is expected to help bridge the digital divide and support the growth of various digital services, including e-commerce, telehealth, and online education.

19. **Investments in both cybersecurity and climate-resilient digital infrastructure are key to ensuring Samoa's long-term digital and economic stability.** As the number of internet users grows, so does the need for robust cybersecurity measures and online safety programs. Strengthening SamCERT's capabilities and implementing comprehensive cybersecurity legislation would help build trust in the digital economy and protect vulnerable users, particularly youth and women.

20. **Building on past successes, this Project represents a crucial next step in Samoa's ongoing digital transformation.** Samoa has made significant strides in its digital transformation journey, leveraging strategic partnerships and targeted interventions to create a more competitive and resilient telecommunications sector. The collaboration with the World Bank has been instrumental in liberalizing the sector and strengthening international connectivity, exemplified by the successful implementation of the Tui Samoa cable system. GoS is now poised to make strategic investments in middle mile fiber infrastructure and last mile access to key institutions. This critical next step will enable both telecommunication companies and government agencies to deliver enhanced digital services to citizens and businesses, with a particular focus on improving connectivity in rural areas.

21. **This Project aims to bridge the gap between Samoa's previous achievements and future aspirations in digital evolution.** As the sector continues to mature and data demand increases, these investments will lay the groundwork for subsequent interventions to further improve last-mile connectivity and service delivery. Looking ahead, Samoa will focus on leveraging existing infrastructure to expand online government services, enhancing SamCERT's capabilities to ensure a secure digital environment, and modernizing the Ministry of Communications and Information Technology (MCIT) and the OoTR to strengthen sector oversight and compliance. These efforts will collectively drive Samoa towards its ultimate goal of a fully realized digital economy, fostering inclusive growth and improved quality of life for all citizens.

C. Relevance to Higher Level Objectives

22. **The Project is fully aligned with multiple strategic frameworks, ensuring comprehensive support for Samoa's digital and economic development**. These include the World Bank Group's Regional Partnership Framework[20] for nine Pacific Island countries, including Samoa, for FY17–FY21, extended to FY23 by the Board of Executive Directors on February 6, 2020[21], the Pacific Island (PIC9) Performance and Learning Review[22], World Bank Group Scorecard, Regional Systematic Country Diagnostic[23] and Samoa's national strategies, including the National Information Communications Technology Sector Plan. Overall, the Project will support the World Bank's mission to end extreme poverty and boost shared prosperity on a livable planet through specifically through targeted technical assistance and funding to improve the ICT infrastructure to positively impact the education, health and

[20] The objectives of the framework relevant to this project are i) Objective 4.2: Increased access to basic services and improved connective infrastructure; and ii) Objective 3.1: Strengthened resilience to natural disasters and climate change.
[21] Report number: 120479
[22] Document number: 139696
[23] Report number: 180998

private sector. The project will also provide assistance to marginalized groups such as disadvantaged women and youth who may be victims of gender-based violence in accessing ICT services to further their education or seek further information on accessing assistance from relevant authorities in a safe, secure and non- threatening

23. **The Project is fully aligned with and significantly contributes to the proposed World Bank Group's RPF for nine Pacific Island countries FY25-29, including Samoa.**[24]
    a. The Project incorporates recommendations from the Performance and Learning Review of the 2020 RPF and will serve as an enabler across all focus areas: (a) fully exploiting available economic opportunities, (b) enhancing access to employment opportunities, (c) protecting incomes and livelihoods, and (d) strengthening the enablers of growth opportunities.
    b. The Project will be implemented in parallel with the SFSRD, which seeks, among other things, to establish the enabling environment for National Digital ID.

24. **The Project also aligns with two World Bank Group Scorecard results indicators relevant to Digital :** (1) Millions of people using broadband internet, and (2) Millions of people using digitally enabled services.

25. **The Project design reflects the recommendations of the Regional Systematic Country Diagnostic,** particularly by aligning with the Green Resilient Inclusive Development[25] agenda and the focus on strengthening the country's resilience.[26] The Project is also aligned with the GoS' goals of the "Pathway for the Development of Samoa (PDS) FY2021/22 to FY2025/26"[27] and "Samoa's Digital Pathway: Digital Transformation Strategy 2023-2030." The Project will support building both enablers and safeguards of the digital economy.

26. **The Project is consistent with Samoa's Nationally Determined Contribution (NDC)[28] 2021 and the goals of the Paris Agreement. In terms of mitigation, Samoa aims to reduce greenhouse gas (GHG) emissions by 30 percent in the energy sector and 4 percent in the waste sector by 2030.**[29] Samoa aims to achieve the NDC by reaching 100 percent renewable electricity generation (within the energy sector) by 2025. On adaptation, the NDC commits to expanding mangrove forests and agroforestry areas and managing the use of forest sustainably. Samoa has also identified "coastal and inland infrastructure" as one of the key focus areas in Samoa Climate Change Policy 2020 for implementing climate resilience measures to reduce the impact of climate-related events. The project will contribute to the above-mentioned country's adaptation and mitigation goals by providing climate-resilient and low-carbon digital connectivity infrastructure and improving access of digital services and climate emergency preparedness to climate vulnerable population. The proposed operation does not hinder the achievement of these goals.

[24] Nine Pacific Island Countries (PIC9) Regional Partnership Framework Performance and Learning Review (Report Number: 145750-EAP); presented to the Board on February 6, 2020. The World Bank will closely monitor the developments of the upcoming WB-RPF covering FY25 through FY29 and reflect its recommendations into the Project.
[25] https://www.devcommittee.org/sites/dc/files/download/Documents/2021-03/DC2021-0004%20Green%20Resilient%20final.pdf
[26] Gould, David M. (ed.); Wai-Poi, Matthew (ed.). 2023. Growth and Resilience: Pacific Islands Systematic Country Diagnostic Update, January 2023
[27] MoF. 2021. "Pathway for the Development of Samoa FY2021/22-FY2025/26"
[28] Samoa's Second Nationally Determined Contribution (2021). https://unfccc.int/sites/default/files/NDC/2022-06/Samoa%27s%20Second%20NDC%20for%20UNFCCC%20Submission.pdf
[29] According to "Samoa's second National Determined Contribution" report, compared to 2007 or compared to the new reference year levels once the GHG emissions inventory is updated.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

27. The Project Development Objective (PDO) is to increase resilient, and inclusive use, of broadband internet and enhancing delivery of digitally enabled services**.**

PDO Level Indicators

28. **The Theory of Change (Figure 1) illustrates the linkage between Project activities and PDO-level outcomes.** Progress toward the achievement of the PDO will be assessed using the following PDO-level results indicators:
    a) Increase resilient[30] and inclusive[31] use of broadband internet
        - Villages passed with resilient FTTP infrastructure (number)
        - People using broadband internet (new use and enhanced) (number) *(Corporate Scorecard Indicator)*
            - People using broadband internet (new use) - Female (Number of people)
            - People using broadband internet (new use) - Youth (Number of people)
            - People using broadband internet (enhanced) - Female (Number of people)
            - People using broadband internet (enhanced) - Youth (Number of people)
        - People living in under- or unserved communities (as defined by OoTR) in the areas exposed to climate and environmental risks provided with access to Internet and to early warning notifications (number) (disaggregated by sex)

    b) Enhance the capacity of the Government of Samoa to deliver digitally enabled[32] services.
        - Government services offered online (number)
        - People using digitally enabled services (new services) (number) *(Corporate Scorecard Indicator)*
            - People using digitally enabled services (new services) - Female (Number of people)
            - People using digitally enabled services (new services) - Youth (Number of people)
            - People using digitally enabled services who find it beneficial (Percentage)

B. Project Components

29. The Project components will be structured as follows:

30. **Component 1: Digital Connectivity and Digital Government Infrastructure (US$15.39 million).** This component will support the development of climate and disaster-resilient national digital connectivity and digital government infrastructure in Upolu and Savai'i. These investments will: (i) deliver a national fiber network improving

[30] Resilience refers to the ability of the infrastructure to withstand, adapt to, and recover from climate and weather events. It also refers to GoS ability to protect and respond to instances of cyber security breaches and to ensure business continuity.
[31] Defined as the situation where everyone in society can participate in the information society.
[32] Digitally enabled public services refers to the provision of public services using digital technologies wherein the interaction with a public organization is mediated by an IT system.

connectivity and lowering prices for public institutions, businesses and citizens of Samoa; (ii) enhance the capacity and coverage of the Government's intranet, facilitating secure, efficient and reliable data exchange across government agencies; and (iii) establish a secure and resilient government data center, Internet Exchange Point (IXP) and provide support for the rollout of broadband pilots that include modernizing National Radio 2AP and enhancing access to Government services. The component will also introduce channels for national-level atmospheric hazards and other disasters early warning monitoring and notification to strengthen resilience of citizens in Samoa by enabling universal access to the National Government Portal[33] and government services online and demonstrating the value of broadband connectivity through pilot activities.

31. ***Subcomponent 1.1: National fiber network to improve service delivery (US$9.20 million).*** This subcomponent will finance the public sector contribution to a public private partnership (PPP) to rollout and deliver a Fiber to the Premises (FTTP) network using green technologies (low-carbon technologies and climate-resilient design approach) that will bridge the digital divide and improve access to digital services particularly in underserved areas of Upolu and Savai'i. Specific activities to be undertaken include deploying new fiber, decommissioning existing obsolete systems which are highly susceptible to weather-related disruptions and interruptions, and incorporating resilience and redundancy features for secure and robust communications. This PPP approach will foster market competitiveness, increase investment incentives among private sector operators and maximize benefits for end users and communities. Models for mobilizing private sector contributions could include capital injections and in-kind contributions, based on the government's assessments completed in the first year of implementation (under Subcomponent 2.1). The FTTP network will connect key government institutions, including Ministries, 166 schools, 11 rural medical centers and 51 Fono Faavae (District development Centers) (see subcomponent 1.2).

32. ***Subcomponent 1.2: Enhancement of the capacity, coverage, security and resilience of the Government's Intranet (US$2.64 million).*** The FTTP network deployed under Subcomponent 1.1 will provide the infrastructure layer that will be used under this subcomponent 1.2 to connect government agencies and establish secure cross-government data and information exchange at the national level. Approximately 90 percent of government agencies outside Apia will migrate from an outdated, end-of-life copper network to the new climate resilient, secure FTTP network. Specifically, this Subcomponent will support the deployment of a robust communication platform equipped with backup functions and recovery plans to ensure continuous operation of government services, facilitate secure and efficient data exchange across government agencies, and allow for better coordination and data sharing at the national level including during emergencies. The investments in climate-resilient technology will help minimize network downtime (currently at a high 10 percent outside Apia), particularly downtime due to weather-related disruptions, eliminate Single Points of Failure (SPOF), and mitigate the impact of power cuts on government agencies, schools, and hospitals. This subcomponent will also finance activities to strengthen cyber resilience through support of SamCERT, protecting the Government network against cyber threats, minimizing the impact of cyber breaches and putting in place business continuity strategies for critical infrastructure, such as utilities and telecommunications, to maintain government services in the event of cyber breaches. Finally, this subcomponent will also support expanded public access by financing the installation of public Wi-Fi hotspots in rural areas.

[33] The National Government Portal refers to a one-stop shop for government services currently under development by the Government of Samoa (GoS). While some features are already available to government users, the goal is to expand access to citizens.

33. ***Subcomponent 1.3: Upgrade and establishment of secure and resilient government data center and support for the rollout of broadband pilot(s) (US$3.55 million).*** Subcomponent 1.3 will finance a secure and resilient government data center, and the rollout of broadband pilots to enhance Samoa's digital infrastructure and services. Specifically, this Subcomponent will:
    a. **Establish a Government Integrated Data Center:** Financing for a Government integrated data center for storing critical data which utilizes renewable, redundant energy sources to minimize network downtime, eliminate SPOF and reduce the carbon footprint. The specifications for the data center will meet good practices for access management, resource efficiency, and security and cyber resilience. Government will seek EDGE certification for any data center infrastructure located domestically.[34] This subcomponent will also finance technical assistance to examine options for incorporating cloud computing to enhance the resilience and security of Government data systems, particularly during national emergencies and climate-related disasters, while also reducing maintenance costs. This analysis will also evaluate the potential use of a private government cloud for securely storing sensitive information.
    b. **Create an Internet Exchange Point (IXP):** Financing for the establishment of an IXP within the government integrated data center to localize internet traffic. This initiative will result in faster network connections, decreased demand for international bandwidth, reduced latency and improved fault tolerance, enhancing the overall efficiency and reliability of the Government's digital infrastructure.
    c. **Pilot Broadband Use Cases:** Several broadband use cases to explore their viability and impact, including: (i) modernizing National Radio 2AP through upgrades and expansions of its transmission capabilities for emergency communications, with a particular focus on early warnings for climate-related events; and (ii) enhancing access to Government services by providing access to the National Government Portal at 12 Fono Faavae (District Development Centers), allowing residents without personal devices to receive alerts, access government services, submit disaster-related information (such as online damage assessments for timely relief fund distribution), and connect with support groups for gender-based violence[35].

34. **Component 2: Strengthening and enhancing the enabling environment for the digital transformation ($3.75 million):** This component will provide support for the design and implementation of the PPP arrangements under component 1, strengthen the Recipient's enabling environment for digital government and the digital economy, and provide ongoing support to traditional regulatory priorities for the telecommunications sector, particularly to promote investment, technological innovation and evolution, and the long-term interests of users of digital services. Additionally, it will provide technical assistance to maximize the use of green technologies and enhance the cybersecurity of critical infrastructure. It will also support skill development initiatives, including efforts to increase gender-inclusive participation in the digital economy.

35. ***Subcomponent 2.1. Transactional, Policy and Regulatory Support for Public Private Partnerships (PPP) and Feasibility Assessment (US$0.80 million).*** Subcomponent 2.1 will support the successful design and implementation of the PPP under component 1.1. Specifically, this subcomponent aims to enhance private sector

[34] EDGE (Excellence in Design for Greater Efficiencies) certification is an internationally recognized green building certification system developed by IFC. The EDGE certification focuses on making buildings more resource-efficient by encouraging the reduction of energy use, water consumption, and the energy embedded in building materials.

[35] The portal will facilitate users access to information on GBV and provide them with email details and phone contact to various support groups, including the emergency response services. There are also plans to integrate a chat feature on the portal for easier communications.

engagement by supporting MCIT's efforts to attract private sector participation in the design, deployment and operation of the national FTTP network through PPP arrangements. The Project will leverage the outcomes of this subcomponent, alongside those from Subcomponent 2.2, to inform the selection of appropriate structures and approaches for implementing Component 1, ensuring that the regulatory and policy environment supports the development and sustainability of digital infrastructure. This includes creating an environment that fosters innovation, leverages private sector expertise, and secures additional financial resources from private entities. Specifically, this Subcomponent will:

a. **Facilitate PPP Transactions:** Provide technical assistance for the feasibility, preparation, negotiation, and implementation of PPP transactions. This involves conducting comprehensive technical, economic, and financial feasibility studies, as well as consultation management, design and cost validation, and the preparation of transaction documentation.
b. **Enhance Regulatory Framework:** Support necessary regulatory reforms that align with PPP initiatives, ensuring a transparent and fair environment for all stakeholders. This includes capacity building to strengthen the regulatory framework and ensure effective oversight of PPP projects.
c. **Identify Efficient Transaction Structures:** Develop and recommend efficient transaction structures and PPP arrangements for the deployment of FTTP networks. This will involve identifying the most effective models for collaboration between the government and private investors.
d. **Conduct Risk Analysis and Allocation:** Assist in performing comprehensive risk analysis to identify potential challenges and determine appropriate risk allocation between the government and private investors. This ensures that risks are managed effectively, and responsibilities are clearly defined**.**
e. **Map Funding Sources:** Identify and map potential funding sources for both capital and operational expenditures to ensure the long-term sustainability of the national fiber network. This includes exploring options for leveraging private investments to support the ongoing costs associated with the network.

36. ***Subcomponent 2.2: Regulatory support, policy and legal framework for digital government and economy (US$2.20 million).*** This subcomponent is divided into several key areas focused on strengthening Samoa's policy, legal and regulatory environment for telecommunications, digital government, and the digital economy. It aims to promote competition, enhance service quality, and ensure equitable access to digital infrastructure. The subcomponent will also focus on training to improve digital skills and improve cybersecurity resilience. Specifically, this Subcomponent will:

a. **Enhance Regulatory Oversight:** Support OoTR in improving regulatory oversight of the telecommunications sector. This includes adopting or amending rules and regulations that promote effective competition, ensure quality of service and affordability, and establish open access standards to the national fiber network. These regulations will be guided by principles of transparency, non-discrimination, and fairness, with oversight of wholesale prices and auditing costs and governance of the Tui Samoa submarine cable system to uphold these principles.
b. **Strengthen Institutional Capacity:** Invest in targeted training programs for MCIT and OoTR staff in digital literacy and cyber hygiene to equip them with the necessary skills to manage and protect digital infrastructure. This also includes procuring essential equipment to support these initiatives.
c. **Modernize Legal and Policy Frameworks:** Assist MCIT in updating and aligning policy, legal, and regulatory frameworks with global best practices, with a particular emphasis on improving institutional and data

governance. This includes developing a sustainable asset management mechanism for infrastructure and services, enhancing data privacy protections, information classification, access to information, cross-border data flow, cybersecurity (including protection against cybercrimes to protect the vulnerable youths including women), and national data governance practices.

d. **Build Digital Skills and Reduce Access Gaps:** Implement measures to build digital skills across the population, focusing on reducing gender-based access gaps and supporting the regulatory priorities of the telecommunications sector.

37. ***Subcomponent 2.3: Enhancement of Cybersecurity (US$0.75 million).*** This subcomponent aims to strengthen the GoS's technical and institutional capacity in cybersecurity, providing a critical foundation for safeguarding digital infrastructure and ensuring the protection of internet and ICT service users, particularly youth and young women. Specifically, this Subcomponent will*:*
    a. **Technical Assistance and Capacity Building** to enhance SamCERT's cybersecurity governance, improve incident response capabilities, and promote online safety;
    b. **Establishment of Critical Infrastructure Protection (CIP) Capacities** to secure vital national digital assets against cyber threats; and
    c. **Rollout of a Cybersecurity Awareness Program** to educate the public and key stakeholders on cybersecurity best practices, thereby fostering a culture of safety and resilience in Samoa's digital environment.

38. **Component 3: Project implementation support (US$0.91 million).** This component will finance technical and operational assistance for Project management and implementation. It will finance the establishment of a Sector Coordination division team within MCIT, which will be led by a Sector Coordinator at the Assistant Chief Executive Officer level, supported by four principal level project officers responsible for financial management, procurement, environmental and social (E&S) and M&E and will be assisted by experts from the Centralized Technical Services Support Unit (CTSSU), under MOF Aid Coordination Management Division (ACMD).

C. Project Beneficiaries

39. **Direct project beneficiaries are expected to include the estimated 80,000 Samoans.** They will directly benefit from robust connectivity through the improvement and expansion of the national fiber infrastructure, improved quality of radio broadcasting through the expansion of the 2AP radio network, both on Upolu and Savai'i, as well as enhanced digitally enabled public services. These improvements will preposition all Ministries and agencies connected to the expanded government network to deliver their services to citizens digitally and significantly improve storage, sharing and security of critical data.

40. **The Project will indirectly benefit an estimated 40,000 Samoans** through the enhanced throughput of the upgraded broadcasting infrastructure and disaster related platform will enable the timely and effective dissemination of critical weather alerts to population most at risk of being impacted, including the vulnerable communities in Savai'i, rural parts of Upolu, and in the outer islands. Additionally, given the cross relevance of the Project outputs to the SFSRD (P181456), under which approximately 100,000 Samoan (80 percent of adults) will receive a verifiable digital ID.

41. **Gender.** In Samoa, as in many other countries, gender disparities in access to and use of digital infrastructure mirror broader socio-economic and cultural issues. While data on Samoa might not be as detailed as that from larger nations, noticeable trends and gender gaps still emerge. Evidence indicates that women in Samoa generally have lower access to smartphones and digital devices compared to men. 78 percent of women surveyed owned a smartphone compared to 82 percent of men, although a larger share of the women (60 percent) than men (50 percent) used it every day (MICS 2019). 49 percent of women had ever used the internet compared to 69 percent of men (MICS 2019). Although internet access has improved over time, regional and community-level connectivity gaps persist, with rural women facing significant challenges in accessing reliable services. Additionally, digital literacy programs may not be equally available to women, and cultural norms can limit their opportunities for digital skills training. These gaps affect women's ability to use technology effectively for personal and professional growth. As digital services become more widespread in Samoa, the risks associated with online safety, such as cyberbullying and privacy breaches, also increase. Gender and online safety in Samoa intersect in several important ways; Women and girls in Samoa, like in many other regions, face gender-specific online safety issues such as cyberbullying, harassment, and stalking. Addressing these gender disparities involves improving technology access, enhancing digital literacy, and creating more opportunities for women to engage safely and fully in the digital economy. Further details on this are articulated in Annex 2. The Project is specifically designed to respond to gender gaps in access to and use of digital infrastructure. Additionally, it will promote online safety to Samoan youth, including vulnerable groups, particularly young women, under subcomponent 2.3. The rollout of broadband pilots under subcomponent 1.3 is expected to benefit women by enhancing access to broadband and essential services at the Fono Faavae's, such as education and other government services. Importantly, and to improve online safety, the project will improve access to grievance reporting mechanism and peer support groups[36], through the National Government Portal. The project will also support training programs targeting women and girls, to promote digital skills and to educate them on the use of internet so they can benefit from opportunities offered by digital technologies. To monitor progress, the project will track the following indicators: (i) Number of female using broadband internet (new use and enhance), (ii). Number of female using digitally enabled services, (iii). Number of female taking training to be safe online; and iv). Number of female being able to successfully report instances of online bullying and abuse[37].

42. **Citizen engagement.** There are avenues for citizen engagement in subcomponent 1.3 (National Government Portal) and subcomponent 2.3 (Rollout of a cybersecurity awareness program). The awareness programs will inform citizens on how to use the portals and gather feedback for ongoing improvements through surveys, while also engaging in direct consultations with stakeholders to support effective uptake and address any concerns. The online redress mechanism offered through the Government portal will enhance transparency and accountability of the government and promote civic engagement and collaborative policymaking, leading to more effective and efficient delivery of public services including the ability of citizens to be contacted for follow up and feedback where relevant. Improved coverage of the 2AP radio broadcast will further empower citizens by keeping them up to date with the latest government news and information and give them opportunity to take part in radio talk back shows to share views. Progress will be measured by monitoring: (i) People using digitally enabled services

[36] Including but not limited to Samoa Victim Support Group, Samoa National Council of Women, Brown Girl Woke, Civil Society Organization National Reference Group and SamCERT

[37] This will be recorded through portal sessions having a pop- up feedback form for the users to ask them the primary purpose of their visit to the portal, in which seeking out support services to peer groups will be an option. Information will also be carried out through satisfaction surveys undertaken during awareness campaigns

who find them beneficial, (ii) number of Government services offered online, (iii) Number of citizens taking a basic net safe practices course; and (iv) Fono Favaae provide information on gender-based violence prevention.

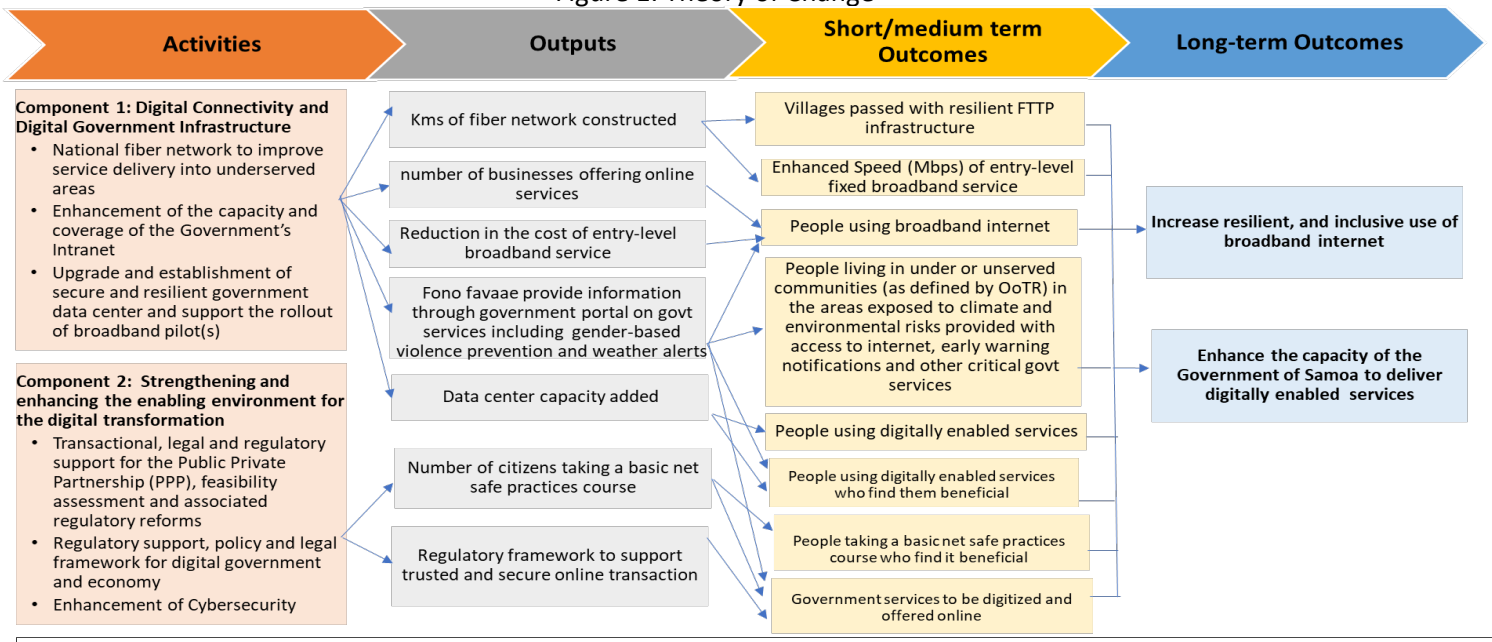
43. **Climate Change.** The investments in digital infrastructure supported under component 1, such as the FTTP network and the National Government Portal, support the overall climate change mitigation and adaptation efforts of the government. While a detailed analysis of the cost differential for incorporating adaptation measures into the infrastructure proposed has not been undertaken by the client, it is expected that the incremental cost of climate proofing would be in the vicinity of 25-30 percent (with Samoa expected to be on the higher end given the higher costs of civil works) of the total build cost.[38] This estimate is based on Fiji's experience of investing in climate resilient infrastructure, and the lessons learned can be applied to Samoa given the similarities of the two countries and the nature of climate vulnerability and hazards faced. Procurement activities involving investments in infrastructure will use green technologies (such as solar power for electricity). Energy efficient designs will be applied to the government data center, National Government Portal and FTTP network. The extension of broadband to remote areas, coupled with reinforcement of existing broadband infrastructure, will improve the overall resilience of the country and facilitate efficient coordination during national emergencies, natural disasters, and subsequent recovery efforts. These are further elaborated in Annex 4.

44. **Maximizing Finance for Development.** Leveraging private sector investment for the FTTP network remains a viable prospect and the approach is backed in principle by the GoS and supported by private operators in Samoa. Private Capital Mobilization (PCM) will be explored contingent on the transactional, policy and regulatory support for and feasibility assessment of Public Private Partnerships (PPP) under subcomponent 2.1, including discussion currently underway between the government and the telecommunications service providers and other stakeholders such as the Electric Power Company (EPC). It is anticipated that private capital may be mobilized under subcomponent 1.1 without impacting the affordability of services to end users. Private sector participation will deliver numerous benefits, including ensuring value for money of scarce public sector financing and minimizing the risks of inefficient infrastructure duplication. It will crowd-in critical skills for network deployment and management and increase overall network utilization. The GoS will consider options to leverage existing infrastructure, where viable, such as purchasing capacity from private sector or retain an indefeasible right of use on the project-financed FTTP for its own purposes to ensure the investment is competitively neutral, without crowding out the private sector. In the event the private sector capital is not mobilized, the network design will be scaled to accommodate the available budget to ensure the network can be scaled up in future should such funding, or funding from additional resources materialize. The project may be restructured contingent on the PPP options to be undertaken by GoS in future to account for the PCM as co-financing.

[38] Cost of investing in climate resilient digital infrastructure (presentation)- MIC (Fiji 2018)

D. Results Chain

Figure 1. Theory of Change



Critical assumptions: Citizens see value in the services launched on the digital government platform. Political will to reform legislative framework on digital government is strong. Cybersecurity training contents are timely and relevant to Samoa.

Key Challenges: (i) Lack of fixed fibre infrastructure creates a bottleneck for enhanced delivery of digital services and expansion of services in rural areas, (ii) End of life Government datacenter, and lack of redundancies to safeguard against loss of critical data, (iii) Current infrastructure is not climate resilient, (iv) Outdated sector policies limits innovation and hinders service delivery, and (v) Limited capacity at SamCERT, OoTR and MCIT limits proper oversight of the sector.

E. Rationale for Bank Involvement and Role of Partners

45. **Public Financing and Regulatory Oversight:** The National Government Portal serves as a public good, ensuring equitable access to broadband and alignment with public policy objectives. Given its role in handling sensitive personal data, public-sector financing is essential to provide stronger regulatory oversight and control over the development process, ensuring adherence to privacy, data protection, and security standards. Similarly, SamCERT is critical to national cybersecurity. Thus, its operation is better suited for public financing.

46. **Challenges and Necessity of Public Sector Financing:** Discussions with telecom operators have revealed that investing in terrestrial fiber networks is not commercially viable in certain areas due to high overhead costs and low population density, which are likely to result in low revenues. Public sector financing is therefore crucial in making investments in these areas feasible. It will help reduce service costs for end users, promote broader access, ensure nationwide rollout, and prevent the digital divide from worsening. Moreover, public financing will ensure that networks are designed with climate resilience and open access in mind, preventing "cherry-picking" by operators who might otherwise install single-access fiber on their own terms. MCIT and the Bank team will further assess the extent of private sector financing that supports financial sustainability.

47. **The Bank's Role and Expertise:** The World Bank is uniquely positioned to support this Project due to its strong track record of implementing digital projects and supporting investments in digital platforms and FTTP in

developing country contexts.[39] The Bank has a longstanding engagement in the Pacific region on ICT sector reform and development, including through the earlier Samoa Connectivity project which successfully crystalized the development of the ICT sector through financing the Tui-Samoa cable system, and leverage private capital via the SSCC; it also facilitated the successful privatization of SamoaTel.[40] Through these previous engagements, the Bank has helped strengthen the legal, regulatory and institutional environment for ICT, enable the transition to a market-driven telecommunication sector, improve connectivity, and establish the foundations for digital government in Samoa. Additionally, the Bank brings global expertise in digital economy and digital government support programs, including its management of similar programs in other economies, and its long-standing partnership with industry and technical institutions. GoS has an active work programme with the Australian Department of Foreign Affairs and Trade (DFAT) on technical cybersecurity training and assessment. The Bank will work closely with MCIT, ICT working group and DFAT to ensure close coordination and to avoid any duplication of activities. There are no other areas of overlap for any other activities as proposed by the project.

F. Lessons Learned and Reflected in the Project Design

48. **This Project leverages lessons learned from recent World Bank-financed projects in Samoa and other Pacific Island Countries (PICs).** The Project design addresses two key challenges: working in a small island state with limited capacity and partnering with two new agencies for implementation. Past projects have shown that projects are more likely to succeed when they focus on targeted objectives and receive substantial preparatory support. To mitigate existing challenges across the Samoa portfolio with the urgency of procurement activities, the proposed implementing structure offers two tiers of support, both project specific and higher level Centralized Technical Services Support Unit (CTSSU), with strong emphasis by the Ministry of Finance (MOF) on building sustainable capacities of implementing agencies through the sector coordination committee. The Bank is also supporting the implementing agencies in the drafting of terms of references (TORs) for technical assistance critical for timely project implementation using advance procurement methodology.

49. **A sector coordination division under the MCIT, headed by a sector coordinator, will channel stakeholder coordination**. The establishment of this division has been championed by MOF and in line with the GoS National Planning Framework, and it is imperative to establish it within three months of effectiveness. Given the cross relevance of this project with the implementation of the NDID component under the SFSRD (P181456), the sector coordinator will work closely with the government's Finance Sector Coordination Division under the MOF and secretariat to the Finance Sector Advisory Committee, which will have oversight on the NDID implementation. This coordination would be essential given the relevance of this project to use cases and utilization of NDID, and in aligning project activities with the government's wider investment and IT reform plans.

50. **A standard-based, technology and vendor-neutral approach to IT will maximize value for money.** The vendor and technology lock-in reduces the sustainability of IT systems and creates high costs that are often passed on to users. To mitigate these risks, the project will minimize dependency on a single vendor-specific solution and

[39] Portfolio of active projects supported by the bank include Kiribati Connectivity Project (P159632), FSM Connectivity Project (P130592), Tonga Digital Government Support Project (P154943), Tuvalu Telecommunications and ICT Development Project (P159395) and Digital Republic of the Marshall Islands Project (P171517)

[40] The Samoa Connectivity Project mobilized US$8.1 million. The amount is higher if accounting for downstream investments in telecom networks triggered by Tui Samoa

technology while ensuring extendable system design (for example, open and modular architecture; open standards and open-source software, where appropriate).

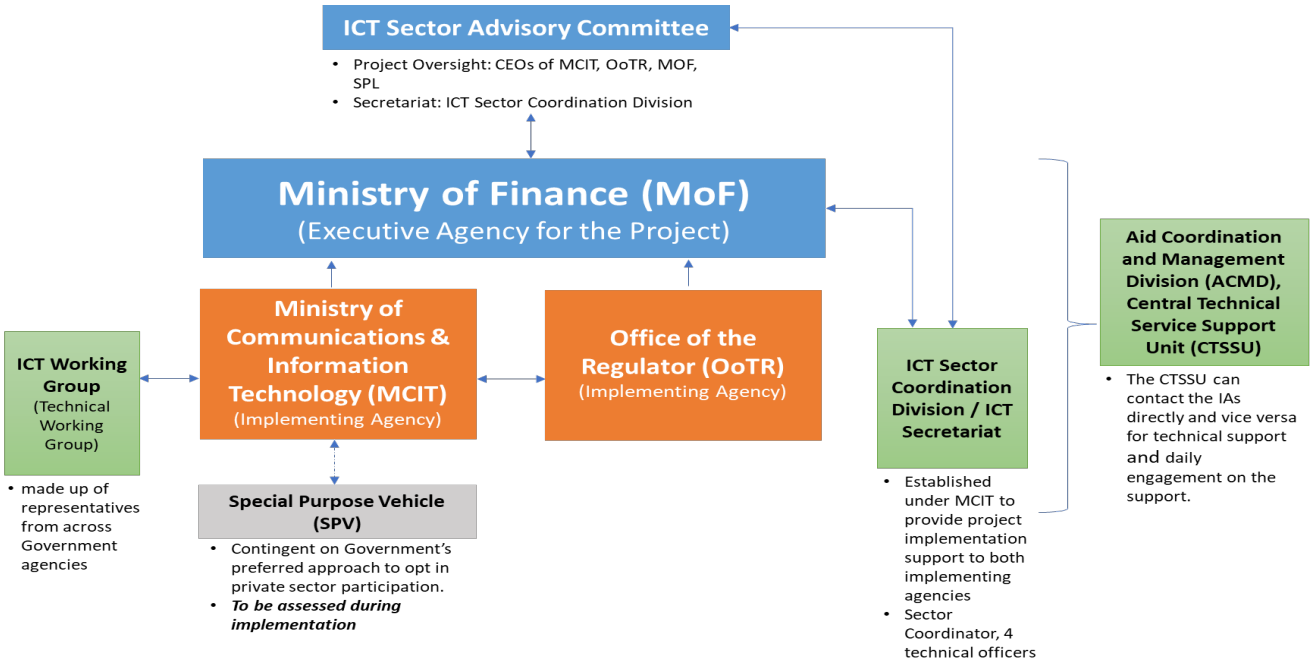
III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

52. **MOF will serve as the executing agency providing oversight on fiduciary functions and MCIT and OoTR will be the implementing agencies (Figure 2).** The project is integrated within the institutional framework of the Information and Communication Technology Sector plan under the guidance of the ICT Sector Advisory Committee (ISAC), chaired by MCIT with MOF, OoTR, Samoa Post Limited (SPL) as the members, among other key stakeholders. MCIT will coordinate with OoTR on activities regarding regulatory reforms and sector coordination (that relate to both technical and regulatory needs). Both MCIT and OoTR have engaged with the Bank during a previous project (WS: Pacific Regional Connectivity Program: Phase 3 – Samoa P128904) where OoTR was one of the four implementation agencies and MCIT was a beneficiary. Depending on the decision on PPP arrangements (if any) there may be a need to include a Special Purpose Vehicle (SPV) to build, own, maintain, and operate the FTTP network, considering the recommendations of the technical assessments and the final decision by the GoS on the preferred way forward.

51. **MCIT will establish a Sector Coordination division and recruit a Sector Coordinator for the Project, and four technical officers within 3 months of project effectiveness**. The technical staff will be responsible for financial management, procurement, E&S and M&E oversight, and where relevant will be assisted by experts from the CTSSU under MOF ACMD, given their experience and familiarity in the implementation and oversight of Bank-funded projects. Technical support during implementation will also be provided to MCIT by the ICT working group, which comprises of representatives from all Government agencies.

Figure 2. Implementation Oversight and Support Relationships for DCRS Project



B. Results Monitoring and Evaluation Arrangements

52. **The ICT Sector Coordination Division/ ICT Secretariat will be responsible for monitoring project implementation, tracking budget utilization, tracking, and reporting results against the Results Framework, and identifying and mitigating challenges.** This includes organizing regular consultations and disclosing relevant project information to stakeholders, as part of the project's Environmental and Social Framework (ESF) commitment. The implementing agencies will develop M&E systems to track PDO indicators and intermediate indicators. The project six monthly report will be prepared by the ICT Sector Coordination Division / ICT Secretariat with input from MCIT technical team and the OoTR, and the support from the CTSSU specialists, and it will submit to the Bank through the ACMD. The report is due to the Bank within 45 days after the reporting period.

C. Sustainability

53. **The Project includes measures to support institutional, operational, and financial sustainability notwithstanding the institutional constraints of human resource capacity.** The proposed approach to expand the fixed fiber infrastructure, including the central storage of critical data within an integrated, interoperable, and equally accessible platform for long-term shared use, demonstrates the government intent to ensure the efficient and properly managed use of resources. This approach is expected to be more sustainable than investment in individual siloed infrastructures. The use of PPP arrangements to build, own, maintain, and operate the FTTP network and data center will be explored, given the MCIT's capacity limitations and the importance of aligning with and leveraging private sector investments. The use of cloud-based solutions, for example, will help minimize the burden of technology upgrades and refreshes that the GoS would otherwise face with extensive data center investments and maintenance, while standardizing ICT resource management and provisioning. Other measures to support sustainability of Project investments include a strong focus on cybersecurity support. The proposed investments are expected to be complemented by recruitment and assignment of qualitied experts in both MCIT and OoTR to ensure sustainability after the Project ends. The CTSSU is expected to provide institutional capacity building to MCIT and OoTR, in core areas like procurement, financial management and E&S management. These agencies will need to develop frameworks, policies and protocols to ensure the sustainability of investments.

54. **The Project is expected to support climate change adaptation and mitigation by incorporating specific measures into the technical designs of the project components.** The focus on adaptation measures will improve climate resilience of the government's service delivery and facilitate management of climate-related risks. Moreover, by supporting the development of National Government Portal, with the information of disaster related data, the Project will contribute to climate change mitigation in Samoa, which is vulnerable to cyclones, storm and sea level rises that are influenced by climate change, by improving citizen's access to climate and disaster related information and supporting them to mitigate the disasters, utilizing the digital technology and data to access critical weather related information and alerts.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

55. **The Economic and Financial Analysis (EFA) shows how the Project is expected to contribute to sustainable economic growth through long-term cost savings and efficiency gains fueled by greater and better digital**

adoption by citizens, businesses, and government entities. The EFA is grounded in a standard Cost-Benefit Analysis (CBA) approach, utilizing available secondary data and informed, reasonable assumptions drawn from prior experience and the ongoing dialogue with GoS. Project net impacts may exceed financial estimates and yield additional economic and social gains, which are captured by the broader economic impact of the Project on Samoan society. In the following paragraphs, both financial and economic analysis for the overall Project are performed under two investments scenarios, which capture whether or not the private sector will invest in the fiber network (subcomponents 1.1). The estimates for the other subcomponents of the Project do not change. See Annex 3 for a full explanation of the assumptions, caveats, and methodology used.

56. **The analysis conducted for the Project estimates the value of anticipated benefits relative to the costs associated with this Project, focusing on the expected financial and economic returns from a proposed investment of US$20.05 million**. The analysis calculates the expected stream of benefits and costs generated by all project components, and it demonstrates how they differ in scenarios with or without private parties contributing additional financing to the extension and upgrade of the national fiber network (subcomponent 1.1). The analysis first measures the *financial rate of return*, which captures the entire Project's estimated profitability. Secondly, it assesses the *economic rate of return*, capturing the estimated welfare impact of the project on Samoan society. The calculations include the costs for project management support (Component 3). Where relevant, the calculations also include a sensitivity analysis to quantify the variations in net impact related to the discount rate and how it adjusts for the time value of money (See Annex 3). While the financial and economic analysis for the overall Project is performed under two hypothetical investments scenarios affecting the fiber network only (subcomponents 1.1), the final decision on the legal and operational arrangements will be taken after the feasibility study is completed (see subcomponent 2.1), and it will specifically consider the implications on the affordability of services for end users

    a. The *base scenario* assumes that the GoS will invest US$9.2 million in the fiber network (subcomponent 1.1.) through a new company ("NewCo"), which is essentially a Special Purpose Vehicle (SPV) primarily established to execute and manage the fiber network. As operational costs and debt servicing are covered, the excess revenues are allocated to the GoS as the ultimate owner and financier. All the other subcomponents of the Project are not affected.
    b. The *alternative scenario* assumes that, in addition to the GoS's investment (US$9.2 million) for the fiber network (subcomponent 1.1), one or more private sector operators will enter into a PPP agreement with additional financing (US$3.5 million). All the other subcomponents of the Project are not affected.

57. **The *financial analysis* for the Project returned a Net Present Value (NPV) of US$1.4 million and an Internal Rate of Return (IRR) of 12 percent at a discount rate of 10 percent in a 20-year timeframe (*base scenario*)**. As the information currently available to the project team is still limited, the analysis presents the financial NPV and IRR for the Project based on how conducive the assumptions are to long-term cost savings and efficiency gains. One potential arrangement, among the many to be considered, is that GoS lends the financing received from the World Bank to a new company that will build, maintain and operate the FTTP network. This arrangement is based on GoS expressed preferences but can change following the feasibility assessment under subcomponent 2.1. Under the *base scenario*, key Project costs for all Project components, when applicable, include CAPEX, OPEX, all recurrent maintenance and asset replacement, and yearly contingency costs estimated at 10 percent of CAPEX to factor in unknown factors in this phase of the project cycle. Financial revenues are generated primarily from subcomponent

1.1, i.e. by leasing fiber to operators (i.e., Digicel, Vodafone, and EPC), government entities (including Fono Faavae), and loan interest. In the *alternative scenario*, all costs to operate and maintain the network are assumed to decrease, as the PPP will bring operational efficiencies, know-how, and the private sector's incentives in achieving returns on their investment. Wholesale revenues are assumed to be higher, as the larger initial funding in the network may expand the market reach to attract more customers and increase sales. Considering all Project components, under the *alternative scenario*, the financial analysis returns an NPV of US$2.5 million and an IRR of 13 percent, higher than the corresponding values under the *base scenario*. Both scenarios include sensitivity assessments to capture the variation in the NPV and IRR according to the different levels of project risk as rated by SORT. See Table A3.1 in Annex 3 for the results and the assumptions made under two scenarios, and a sensitivity analysis.

58. **The *economic analysis* for the Project returned an NPV of US$11.7 million and an IRR of 29 percent at a 10 percent discount rate (*base scenario*)**. In addition to financial benefits, under the *base scenario* the Project is also expected to return economic benefits, which are not easily quantifiable given the wide range of potential beneficiaries (people, households, businesses, and institutions). For all Project components, the economic analysis includes the costs computed in the financial projections above, since the Project is not expected to return negative externalities for the Samoan society. However, the Project is expected to lead to positive externalities, such as savings for the government budget resulting from operational efficiencies. In fact, the expansion of the government's Intranet, especially in previously unserved or underserved communities, is expected to reduce transaction costs and processing time for public services and streamline communications across government entities during emergencies, which can stimulate economic growth by leveraging on the new government portals (i.e., education). In the *alternative scenario*, the Project is expected to increase economic benefits as fixed broadband penetration rate increases, in particular in rural areas, and additional people and businesses use wireless broadband; in this scenario, the Project is estimated to return an economic NPV of US$40.6 million and IRR of 66 percent. Both scenarios include sensitivity assessments to capture the variation in the economic NPV and IRR with respect to variations in the discount rate. See Table A3.1 in Annex 3.

59. **The proposed operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation**.

    a. Assessment and reduction of mitigation risks: Activities proposed under this operation support data and network infrastructure and capacity building to enhance digital connectivity in Samoa and are considered universally aligned. Activities supporting upgrade and establishment of data center is low risk given that the energy consumed will be largely generated from renewable source (solar). Furthermore, the Project will integrate a Technical Assistance to assess and determine energy efficiency standards and energy specifications (energy STAR, EDGE), to improve energy performance levels by 20 percent), meeting best international practices on 'greening' the data centers.

    b. Assessment and reduction of adaptation risks: Nearly 70 percent of the population and infrastructure are in low-lying coastal areas that are extremely vulnerable to climate change impacts such as floods, tropical cyclones, intense rainfall, storm surges, sea level rise, etc. These climate hazards threaten the project's physical investments such as the middle and last mile fiber optic networks, communication towers, data center, etc. The Climate and Disaster Risk Screening Report (CDRS) has assigned high risk ratings to exposure of the project location and Impacts on the project's physical infrastructure and assets and a

moderate risk rating for Risk to the outcome/service delivery of the project. The project will reduce these adaptation risks to an 'acceptable' level by deploying climate-resilient installation of fiber optics and integrating network reliability and resilience measures in data infrastructure. It will also add redundancy to the government intranet and the national broadcaster which are critical communication infrastructure needed to issue the early warnings and respond to climate events and disasters, thereby contributing to Samoa's resilience to climate impacts. Specific climate adaptation, mitigation and resilience measures are detailed in the Annex 1. Thus, the residual level of risk from climate hazards to the operation is moderate and considered acceptable.

B. Fiduciary

60. **Financial Management.** A FM capacity assessment of MCIT and OoTR was carried out to determine whether the existing FM arrangements correctly and completely record all transactions and balances; facilitate the preparation of regular, timely and reliable financial statements; safeguard the Project's assets; have reasonable controls; and that independent and competent audit arrangements are in place. The existing FM arrangements of MCIT and OoTR are acceptable to meet the FM requirements as stipulated by the Bank Policy on Investment Project Financing. The project's overall financial management risk is rated as 'Moderate'. The FM risk for MCIT is moderate, and the FM risk for OoTR is also rated as 'Moderate,' as MCIT and OoTR are required to comply with the financial management processes and procedures detailed in the "Public Finance Management Act (PFMA) 2001" and "Treasury Instructions (TI) 2015". The Government Financial Management Information System (FMIS) named Finance One, will be used for this Project. Quarterly IFRs (Interim unaudited Financial Statements) and annual audited financial statements will be required. A designated account will be opened for this Project at the Central Bank of Samoa (CBS). Both MCIT and OoTR will process project activities payments through the ICT Sector Coordination Division/ICT Secretariat under MCIT and submit to the MOF through the ACMD to verify and process all project payments. Submission of annual budgets will be required by a date specified in the financing agreement. Details of the FM arrangements are shown in Annex 1.

61. **Procurement.** Procurement will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers (Fifth Edition, September 2023) and will be subject to the World Bank's Anti-Corruption Guidelines (October 15, 2006, revised in January 2011, and as of July 1, 2016). The World Bank standard procurement documents will be used for all procurement under international competitive bidding activities. In addition, the GoS procurement legislation, including the PFMA 2001 Part 12, Treasury instructions Section 6, and B4 Schedule, and Procurement Operating Manual (to be prepared and adopted within 3 months of effectiveness) to be followed. The Project will utilize a web-based procurement tracking system, STEP, to communicate procurement review requests with the Bank. The CTSSU and ACMD will assist MCIT and OoTR with procurement implementation and ensure that project procurement is consistent with the Bank's procurement regulations. Although the Project has two implementing agencies, MCIT and OoTR, MCIT will manage all procurement activities under one procurement plan. The major procurement risks identified during the assessment, which could impact the achievement of the Project's objectives, and the mitigation measures are detailed in Annex 4. The implementing agencies have prepared their Project Procurement Strategy for Development (PPSD) and Procurement Plan for the first 18 months of implementation , outlining that procurement will be managed by MCIT, with hands-on support from the CTSSU. In addition, MCIT will recruit the national procurement consultant to assist in the implementation. The Project has identified ten (10) procurement activities at an estimated cost of USD 3.03 million to be procured with advance procurement arrangements before the Project's effectiveness. The procurement

plan includes 24 procurement activities at a total estimated cost of USD 9.62 million. One high-value procurement activity for FTTP, at an estimated cost of USD 9 million, was not identified during the preparation period, as the implementing agency will recruit a feasibility study firm to explore the best fit-for-purpose technical options and will discuss this further. Detailed arrangements can be seen in Annex 1.

C. Legal Operational Policies

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

62. **Environmental and social risks associated with the Project are considered moderate.** The Project consists of two typologies: digital infrastructure and technical assistance (TA) activities for two main islands of Upolu and Savai'i. The digital infrastructure component involves the installation of connectivity infrastructure, such as fiber connections, software, and hardware, as well as the rollout of broadband pilot(s) to enhance capacity and throughput. The TA activities support the digital government strategy, the legal and institutional framework for digital government, the upgrade of the government data center, and the strengthening of policies and regulations for digital government and the digital economy. The benefits of increased connectivity are increased access to government services, welfare, education; and better connectivity to family, friends and social networks. However, increased connectivity can also result in increased risks for the community, including cyber-attacks (i.e. phishing, ransomware), cyber bulling, and exposure to illicit material and exploitation of youths (particularly females). These risks can be managed through strengthened ICT regulatory environment and cyber awareness campaigns. Privacy and data security risks associated with the digital government platform can be managed through design. There are also risks relating to unequal access to benefits which the Project will mitigate by supporting last mile fiber to premises connectivity for unserved and underserved communities as well as pilot initiatives for public sites such as medical facilities, schools and government offices. Social and land access impacts are expected to be limited and can be managed through stakeholder engagement and project design and choice of technology and siting. A Stakeholder Engagement Plan has been prepared and disclosed on August 15, 20024 on MCIT's website.[41] Potential environmental and occupational health and safety (OHS) risks are associated with encountering unknown cables and services and improper disposal of waste materials. Environmental and social impacts can be managed with partial use of Samoa's E&S Framework. The Project includes resources including an IA E&S specialist, supported by the CTSSU E&S specialist to ensure implementation of these elements of the Samoa's ESF are consistent with the World Bank ESF. The Project's ESCP includes measures necessary to address project-related environmental and social risks and impacts in accordance with the World Bank ESF. The ESCP was disclosed on MCIT's website on September 14, 2024.[42] The Bank disclosed the SEP and the ESCP on September 15, 2024 and September 19, 2024 respectively.

[41] https://mcit.gov.ws/wp-content/uploads/2024/08/Samoa-Digital-SEP_August-2024.pdf
[42] https://mcit.gov.ws/wp-content/uploads/2024/09/DCRS-ESCP-Negotiated_13September2024.pdf

V. GRIEVANCE REDRESS SERVICES

63. **Grievance Redress.** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank'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 Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's Grievance Redress Service (GRS), visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's Accountability Mechanism, visit https://accountability.worldbank.org.

VI. KEY RISKS

64. **The overall Project risk is assessed to be Substantial.** The rating reflects substantial risks in macroeconomic, technical design, institutional capacity for implementation, and fiduciary. The implementing agencies are familiar with the modalities of executing Bank projects and the previous experience. However, limited capacity could increase the risks of delays and non-compliance with Bank processes. Preparatory assessments undertaken to support the design of components will reduce risks of delays in implementation.

65. **Macroeconomic risk is rated Substantial.** Samoa has a narrow economic base and high vulnerability to external shocks and natural disasters. The global economy remains fragile - a sharper than expected slowdown in global growth could affect tourism recovery, dampening domestic demand. Continued pressure on CBR (Correspondent Banking Relationships) could limit correspondent banking services and potentially affect remittance inflows and trade, two important drivers of growth. While these risks are being partially mitigated through other projects including the Second Recovery and Resilience Development Policy Operation with A Catastrophe Deferred Drawdown Option (P180842) and the Pacific Strengthening CBR Project (P502591), the residual risk remains substantial.

66. **The risk related to the Technical Design of Project is Substantial**. The Project's success is intrinsically tied to the effective collaboration between the government and private sector, underpinned by principles of fairness and efficiency. This partnership is essential to avoid redundancy, optimize resource allocation, and foster mutually beneficial outcomes for both public and private stakeholders. This risk will be mitigated by supporting the Government to assess options for leveraging existing infrastructure while simultaneously preserving the incentives for private sector investment and ensuring the Project's environmental impact remains minimal. Technical skills may be limited locally in specific areas of expertise, such as cybersecurity and terrestrial fiber network planning and design, and may need to be significantly bolstered by external resources. Although preliminary discussions with telecommunications service providers indicate a strong interest in private sector participation, this will depend on the GoS's ability to identify a viable PPP model and implement fair, non-discriminatory, and transparent selection processes. Additionally, the development outcome of Component 1 is

partially contingent upon the sustained operation of the 51 Fono Faavae, a factor that lies beyond the direct scope of the Project.

67. **The software and operations of NDID are being implemented through the SFSRD Project, which increases the risk related to Technical Design and Institutional capacity.** The separation of activities in the two projects introduces potential challenges with coordinating implementation and procurement timelines and specifications, which are exacerbated by limited GoS technical capacity and human resources. For example, experiences in other digital platform interventions in the Pacific have highlighted that one of the major challenges is the planning, design, and configuration of data centers and cloud resources to host such platforms. Conversely, the development outcome of this Project is partly dependent on accurate and timely specifications provided by the Samoa Bureau of Statistics, the implementing entity for the digital ID. This interconnected dependency increases the risk that the full potential of this Project may not be realized if aspects of coordination fail. This risk will be mitigated through close coordination between the respective World Bank teams, including joint missions, and by the digital ID component in SFSRD being led by the Digital Development Global Practice. Additionally, the centralized coordination unit, CTSSU, will ensure the coordination of the two projects. Nonetheless, even a seamless internal collaboration cannot remove the risk of coordination challenges on the GoS side.

68. **The risk related to Institutional Capacity for Implementation and Sustainability is Substantial.** The rating reflects the limited implementation capacity of the implementing agencies. This risk will be mitigated through establishment of the Sector Coordination Division, capacity building of the implementing agencies and mobilization of external technical experts to support implementation. The CTSSU provides support to all Bank projects in Samoa, including fiduciary, procurement, E&S, monitoring and evaluation and coordination functions. Experts from CTSSU will also be mobilized to provide support for FM, procurement, environmental and social, and M&E functions.

69. **The consolidated Fiduciary risk for the Project is Substantial.** The procurement risk rating is classified as substantial while and the Financial Management (FM) risk is moderate. Procurement for the Project will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers (Fifth Edition, September 2023), as well as the provisions stipulated in the Financing Agreement and the Project's Procurement Plans. The PIUs – MCIT and OoTR – shall use the STEP system and the new contract management module to improve contract implementation. This will equip MCIT and OOTR to better track deliverables, performance indicators and payments among others. The Bank carried out the capacity assessment on the implementing agencies on July 8, 2024. There are some risk factors that may negatively impact project implementation such as limited capacity of the implementing agencies, the lengthy review and approval process for procurement activities, supply chain disruption, and inflation due to external factors. To mitigate against these risks, the CTSSU will support MCIT on procurement and contract management oversight. In addition, the implementing agencies have prepared the project procurement strategy after identifying the activities under the Project and draft a procurement plan. The Project's FM risk is rated as moderate. The existing FM arrangements of the proposed implementing agencies are assessed as acceptable to meet the FM requirements as stipulated in the Bank Policy on Investment Project Financing. As ministries, OoTR and MCIT are bound by the Public Finance Management Act and the Treasury Instructions, and they operate on acceptable accounting standards. All project activities and proposed expenditures are standard in nature. The main risks relating to this Project are staff capacity constraints at the MCIT to meet the Project's financial reporting obligations, in addition to the challenges arising from the

involvement of multiple implementing agencies which may complicate the financial statements' consolidation process and cause delays in submitting the annual audits. The proposed mitigating measures include (i) the recruitment by MCIT of a finance officer to timely prepare Project financial reports; (ii) a financial management chapter to be included in the Project Operating Manual (POM); (iii) the completion by MCIT of the financial statements for the Project within three months after end of the prior financial year to ensure sufficient time for the auditing process and subsequent timely submission of the audit reports; (iv) MOF will centralize project payments using the government FMIS; and (v) the FM Specialist of the CTSSU will support MCIT and OoTR to enable preparation of the financial reports for the Project.

VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Closing Period
a) Increase resilient and inclusive use of broadband internet		
People using broadband internet (new use) (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	10,000	35,000
➢People using broadband internet (new use) - Female (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	5,000	15,000
➢People using broadband internet (new use) - Youth (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	7,000	18,500
People living in under- or unserved communities (as defined by OoTR) in the areas exposed to climate and environmental risks provided with access to Internet and to early warning notifications (Number)		
Oct/2024	Oct/2027	Oct/2029
0	7,000	35,000
➢Number of Females in target areas having improved access - Female (Number)		
Oct/2024	Oct/2027	Oct/2029
0	3,000	10,000
People using broadband internet (enhanced use) (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	5,000	20,000
➢People using broadband internet (enhanced use) - Female (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	3,000	10,000
➢People using broadband internet (enhanced use) - Youth (Number of people) CRI		
Oct/2024	Oct/2027	Oct/2029
0	5,000	12,500

Villages passed with resilient FTTP infrastructure (Number)		
Oct/2024	Oct/2027	Oct/2029
0	7	20
b) Enhance the capacity of the Government of Samoa to deliver digitally enabled services		
Government services offered online (number) (Number)		
Oct/2024	Oct/2027	Oct/2029
0	1	4
People using digitally enabled services (new services) (Number of people) [CRI]		
Oct/2024	Oct/2027	Oct/2029
0	7,000	25,000
➢People using digitally enabled services (new services) - Female (Number of people) [CRI]		
Oct/2024	Oct/2027	Oct/2029
0	5,000	12,500
➢People using digitally enabled services (new services) - Youth (Number of people) [CRI]		
Oct/2024	Oct/2027	Oct/2029
0	7,000	17,000
➢People using digitally enabled services who find it beneficial (Percentage)		
Oct/2024	Oct/2027	Oct/2029
0	40	65

Intermediate Indicators by Components

Baseline	Period 1	Closing Period
Component 1. Digital Connectivity and Digital Government Infrastructure		
Kms of fiber network constructed (Kilometers)		
Oct/2024	Oct/2027	Oct/2029
18	300	700
Fono favaae provide information on gender-based violence prevention (Number)		
Oct/2024	Oct/2027	Oct/2029
0	2	10
Increase in % of renewable energy consumed in the government data center (Percentage)		
Oct/2024	Oct/2027	Oct/2029
0	0	25

Data Centre capacity added (TB) (Number)		
Oct/2024	Oct/2027	Oct/2029
60	0	480
Speed (Mbps) of entry level fixed broadband service (number) (Number)		
Oct/2024	Oct/2027	Oct/2029
2	20	100
Price ($) of entry level fixed broadband service (amount (USD)) (Number)		
Oct/2024	Oct/2027	Oct/2029
55	40	25
Component 2. Strengthening and enhancing the enabling environment for the digital transformation		
Number of citizens taking a basic net safe practices course (Number of people)		
Oct/2024	Oct/2027	Oct/2029
0	10,000	40,000
➢Females that undertake training to be safe online (Number)		
Oct/2024	Oct/2027	Oct/2029
0	5,000	20,000
➢People taking a basic net safe practices course who find it beneficial (Percentage)		
Oct/2024	Oct/2027	Oct/2029
0	30	65
SamCERT function is enhanced, capacities and expertise expanded and cybersecurity protection level strengthened (Yes/No)		
Oct/2024	Oct/2027	Oct/2029
No	yes	Yes
➢females being able to successfully report instances of online bullying and abuse (Number of people)		
Oct/2024	Oct/2027	Oct/2029
0	50	150
Regulatory framework to support trusted and secure online transaction (Yes/No)		
Oct/2024	Oct/2027	Oct/2029
no	yes	yes
Component 3. Project implementation support		

Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Increase resilient and inclusive use of broadband	
Villages passed with resilient FTTP infrastructure (Number)	
Description	Number of actual villages in Samoa that are connected to the FTTP network
Frequency	Quarterly
Data source	FTTP Build Progress Report
Methodology for Data Collection	OoTR will work in coordination with MCIT and conduct a verification
Responsibility for Data Collection	OoTR in coordination with MCIT
People living in under- or unserved communities (as defined by OoTR) in the areas exposed to climate and environmental risks provided with access to Internet and to early warning notifications (number) (disaggregated by sex)	
Description	Number of people having improved access to the internet
Frequency	Bi-annual
Data source	OoTR Sector Report
Methodology for Data Collection	FTTP Build Progress Report
Responsibility for Data Collection	OoTR in coordination with MCIT
People using broadband internet (new use) (enhanced) (disaggregated by sex) (youth)	
Description	Number of new users of internet
Frequency	Bi-annual
Data source	OoTR Sector Report
Methodology for Data Collection	OoTR survey
Responsibility for Data Collection	OoTR in coordination with MCIT
Enhance the capacity of the Government of Samoa to deliver digitally enabled public services	
People using digitally enabled Government services (number) (disaggregated by sex) (youth)	
Description	The number of users who would be accessing online services offered by Government through the Government portal.
Frequency	Bi-annual
Data source	MCIT Report on portal use
Methodology for Data Collection	System generated
Responsibility for Data Collection	MCIT
People using digitally enabled services who find it beneficial (Percentage)	
Description	A satisfaction survey (through an online feedback form) would be taken to measure what percentage of users found accessing the services online benefical. The same survey would also be undertaken during the awareness outreach programmes undertaken by Ministry
Frequency	For the online feedback form- After completion of each user session.For in-person feedback during awareness – Bi annualy.
Data source	MCIT Report on portal use and user feedback form for in-person interviews
Methodology for Data Collection	System generated and in-person interviews
Responsibility for Data Collection	MCIT
Government services offered online	
Description	Number of government services digitised and available online via the Government portal
Frequency	Quarterly

Data source	MCIT portal Report
Methodology for Data Collection	System generated by MCIT
Responsibility for Data Collection	MCIT

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Component 1	
Kms of fiber network constructed	
Description	The total KMs of fiber added to the SNBH, either by way of lease or new construction
Frequency	SNBH Build Progress Report
Data Source	OoTR will work in coordination with MCIT and conduct a verification
Methodology for Data Collection	OoTR in coordination with MCIT
Responsibility for Data Collection	SNBH Build Progress Report
Fono Faavae provide information on gender-based violence prevention	
Description	The Fono Faavae will help connect victims to support services
Frequency	Bi-annual
Data Source	MCIT Report on portal use
Methodology for Data Collection	System generated
Responsibility for Data Collection	MCIT
Increase in % of renewable energy consumed in the government data center	
Description	This indicator will measure the % of energy generated for the data center using renewable energy.
Frequency	Bi-annual
Data Source	MCIT Report
Methodology for Data Collection	System generated
Responsibility for Data Collection	MCIT
Data Centre capacity added (number)	
Description	Enhanced storage capacity of data center facilitated by the Project
Frequency	Bi-annual
Data Source	MCIT Report
Methodology for Data Collection	System generated
Responsibility for Data Collection	MCIT
Speed (Mbps) of entry level fixed broadband service (number)	
Description	Speed of the entry level service as validated by OoTR
Frequency	Bi-annual
Data Source	OoTR technical reports
Methodology for Data Collection	OoTR technical monitoring
Responsibility for Data Collection	OoTR
Price ($) of entry level fixed broadband service (USD)	
Description	Monthly subscription cost for the entry level service (post pay)
Frequency	Bi-annual
Data Source	OoTR reports
Methodology for Data Collection	OoTR sector survey
Responsibility for Data Collection	OoTR

Component 2	
Number of Citizens taking a basic net safe practices course	
Description	Citizens taking a basic online safety course as designed by SamCERT.
Frequency	Bi-annual
Data Source	SamCERT Report
Methodology for Data Collection	System generated report
Responsibility for Data Collection	MCIT
People taking a basic net safe practices course who find it beneficial (Percentage)	
Description	Citizens who complete the course will be sent a post completion evaluation form online, as well as a follow up evaluation every 6 months after completion of course to track the success of their learnings and to get feedback on how the course can be improved
Frequency	After completion of course and bi-annually thereafter
Data Source	MCIT Report
Methodology for Data Collection	System generated
Responsibility for Data Collection	MCIT
SamCERT function is enhanced, capacities and expertise expanded and cybersecurity protection level strengthened	
Description	SamCERT is able to serve the needs of the Government and citizens in ensuring their safety online
Frequency	Bi-annual
Data Source	SamCERT
Methodology for Data Collection	User Survey
Responsibility for Data Collection	MCIT
Regulatory framework to support trusted and secure online transactions	
Description	Regulatory framework put in place by Government and OoTR
Frequency	Bi-annual
Data Source	OoTR Report
Methodology for Data Collection	OoTR sector update reports
Responsibility for Data Collection	OoTR

ANNEX 1: Implementation Arrangements and Support Plan

1. The Project implementation will be fully integrated and mainstreamed in the current structures of the Government of Samoa. The Project is therefore fully owned by the Government which is committed to implementing activities initiated under the Project.

Project Institution and Implementation Arrangements

2. The project is integrated within the institutional framework of the Information and Communication Technology Sector plan under the guidance of the ICT Sector Advisory Committee (ISAC), chaired by MCIT with MOF, OoTR, Samoa Post Limited (SPL) as the members, among other key stakeholders. MOF will serve as the executing agency providing oversight on fiduciary functions and MCIT and OoTR will be the implementing agencies. MCIT will coordinate with OoTR on activities regarding regulatory reforms and sector coordination (that relate to both technical and regulatory needs). The implementing agencies will work closely with the members of the ICT working group that comprises of ICT technical staff from across different Government agencies. This will be particularly important for rolling out use cases, especially in areas outside of Apia, where MCIT and OoTR will not normally have staff presence. The ICT working group will be provided training by MCIT on specific expectations related to the project deliverables. MCIT will establish a Sector Coordination division and recruit a Sector Coordinator for the Project, and four technical officers within 3 months of project effectiveness. The technical staff will be responsible for financial management, procurement, E&S and M&E oversight, and where relevant will be assisted by experts from the CTSSU under MOF ACMD, given their experience and familiarity in the implementation and oversight of Bank-funded projects. Technical support during implementation will also be provided to MCIT by the ICT working group, which comprises of representatives from all Government agencies. The creation of the SPV will be contingent upon GoS's preferred option to leverage private sector participation into the project. Further arrangements regarding the SPV will be articulated during the assessment, and implementation. Further roles of each agency is defined in detail in the table below.

Table A1.1: Project Implementation Organizations and their Responsibilities

Project Implementation Organizations	Management Roles and Responsibilities
ICT Sector Advisory Committee *Level: Policy coordination*	• Oversight of project performance and management • Review documentation, including project updates • Coordination between other sectors including the private sector (including but not limited to telecommunication companies) • Ensure alignment of Project to the ICT sector plan
Ministry of Finance (MOF) *Level: Strategic management*	• MOF will serve as the executing agency providing oversight on fiduciary functions and MCIT and OoTR will be the implementing agencies. • Depending on the decision on PPP arrangements (if any) there may be a need to include an SPV to build, own, maintain, and operate the FTTP investments, considering the recommendations of the technical assessments and the final decision by the GoS on the preferred way forward.

Project Implementation Organizations	Management Roles and Responsibilities
ICT Working Group *Level: Implementation Assistance*	• Technical support during implementation will also be provided to MCIT by the ICT working group, which comprises of representatives from all Government agencies. The working group will help MCIT and OOTR in defining technical requirements and providing technical inputs for the Project. • The ICT working group will work closely with external consultants for the Project in facilitating requirements and other documentary procedures which may be within the purview of the agency. Members of the working group will perform functions including: • Coordinating with end-user units and SCD to define requirements; • Providing technical inputs for the development of terms of reference, specifications, concept notes; • Vetting/reviewing of requests and proposals; • Helping MCIT in drafting and review of contracts; • Reviewing technical reports.
Ministry of Communications and Information Technology Office of the Regulator *Level: Implementation*	• Administers the Project as the implementing agency of the WB loan (MCIT); • Assumes overall responsibility for Project administration, supervision and implementation (MCIT); • Monitors and evaluates the Project implementation progress (MCIT); • Supports both government and Bank in complying with reporting requirements (MCIT); • Reviews and endorses any proposed change in the Project scope (MCIT); • Prepares withdrawal applications and endorses the same to MOF, before submission to Bank (MCIT); • Reviews and authorizes procurement activities, consultancy requirement and other activities (MCIT); • Reviews and approves budget and work plan proposals (MCIT and OoTR) • Assumes responsibility for maintaining and keeping records for the interest account, including monitoring of Project cost balances in coordination with the SCD (MCIT); • Ensures compliance with agreed guidelines and procedures (MCIT and OoTR); • Signs contracts with consultants/suppliers (MCIT and OoTR); • Reviews and endorses payment requests for consultants/suppliers; (MCIT and OoTR); • Maintains Project books and accounts and manage financial reporting and accountability aspects (withdrawal applications, financial statements and reports, bank account statements, etc.) (MCIT) • Leads the financial management, in accordance with *WB's Disbursement Guidelines for Projects* (2006, as may be amended from time to time) (MCIT)
Sector Coordination Division (SCD) *Level: Management and Implementation*	• The SCD will be responsible for the overall implementation of the Project's work and financial plan as approved by the PSC. To be headed by a Sector Coordinator, the SCD has the following tasks and responsibilities:

Project Implementation Organizations	Management Roles and Responsibilities
	• Oversees the day-to-day implementation of the Project; • Coordinates the implementation of the Project, and acts as the focal point for communication with the Bank and other development partners; • Manages procurement activities; • Develops guidelines necessary to effectively implement the Project's components; • Monitors and evaluates Project activities and outputs, with periodic reviews, and identifies and reports issues and required action plans; • Ensures Project compliance with the environmental and social requirements; • Prepares regular quarterly progress reports, and Project completion report for timely submission to WB; • Sets up and maintains a strong Project financial management system; • Reports periodically to the MCIT, OOTR, MOF and WB; • Assists the EA in ensuring compliance with covenant of the Loan Agreement.
Centralized Technical Services and Support Unit (CTSSU) *Level: Management and Implementation*	• Provides guidance to the SCD, through embedded experts under MOF, given their experience and familiarity in the implementation and oversight of Bank-funded projects.

Financial Management

3. **Accounting and Maintenance of Accounting Records.** The Government Financial Management Information System, Finance One will be used to record the Project's transactions, and payments will be verified and made by the MOF at the request of MCIT and OoTR who are required to comply with the Public Finance Management Act and Treasury Instructions.

4. **Budgeting.** Activities and figures included in the budget are realistic and relevant to the Project, including goods (such as office equipment, software, IT equipment), works, consulting services, non-consulting services, training and workshops, and operating costs. An Annual Work Plan and Budget (AWPB) containing all project-eligible activities and expenditures proposed for the following fiscal year will be prepared by MCIT through their Sector Coordination Division, with OoTR inputs, and will be submitted to the Bank through the MOF ACMD for approval no later than June 30 of each year during implementation of the project. MCIT will monitor budget execution and variances and will ensure that the project is implemented as per the approved AWPB. The IAs will work closely to ensure consistency and adherence to the project's objectives.

5. **Funds Flow.** Funds will flow from the World Bank (WB) to the Government of Samoa (GoS) into the Designated Account (DA) for advances, or for reimbursement of pre-financed expenditures. Additionally, funds can be disbursed to contractors via direct payment or to suppliers' commercial banks for special commitments. A designated account will be opened for this project at the CBS. Both MCIT and OoTR will process the project activities payments through the ICT Sector Coordination Division / ICT Secretariat under MCIT and submit to the MOF through ACMD to verify and process all project payments.

6. **Internal Controls.** Government agencies in Samoa are required to comply with the financial management processes and procedures detailed in the "*Public Finance Management Act (PFMA) 2001*" and "*Treasury Instructions (TI) 2015*". The Internal Audit and Investigation division within the MOF provides independent and oversight internal audit and investigation functions across Government ministries and public bodies. A pre-audit process function is furthermore performed by the Samoa Audit Office over government ministry transactions processed through the Finance One system. All project financial management roles, responsibilities, and processes will be clearly set out in the project financial management instructions as part of the Project Operating Manual (POM). The internal control arrangements are considered acceptable for this project.

7. **Periodic Financial Reporting.** MCIT will be the lead agency and will prepare quarterly unaudited interim financial reports (IFRs) for the Project, with inputs from OoTR and will send them to MOF through the ACMD for final review and submission to the Bank. The quarterly IFRs will include an analysis of actual expenditure for the quarter, year to date, and Project to date, plus outstanding commitments, compared against total project budget, and as required under Government of Samoa Public Finance Management Act. The format will be developed with the assistance of the CTSSU FM specialist and agreed by MCIT, MOF and the Bank. The quarterly IFRs will be submitted by MCIT Sector Coordination Division to the MOF ACMD to review and for submission to the World Bank within 45 days of the end of each calendar quarter. A contract register and asset register will be maintained to ensure adequate controls over project contractual payments and assets.

8. **External Audit.** The annual audited financial statements for the Project must be received by the WB within six months of the end of the fiscal year, e.g., by December 31 each year, and shall be made publicly available by the Recipient in a manner acceptable to the WB according to the General Conditions of IDA Grants. MCIT will prepare the financial statements for the Project with inputs from OoTR by end of September each year and will submit to MOF ACMD to allow sufficient time to engage with the Samoa Audit Office for the audit work. MOF ACMD will submit the audit report to the Bank no later than six months after the end of the fiscal year, e.g., by December 31 each year. MCIT will maintain a register to document the follow-up of the auditors' recommendations reported in the management letter, which will be available to the Bank when required.

9. **Counterpart funding**. As the Project is funding 100% of eligible expenditure and inclusive of tax, no counterpart funding is envisaged.

10. **Project Preparation Advance (PPA).** The government decided not to use PPA.

Disbursements

11. **Disbursement Methods and supporting Documentation Arrangements.** The Project could use four disbursement methods: (a) advance to the designated account (b) direct payment; (c) reimbursement, and (d) special commitments. Direct payment would only be used for large payments. Reimbursement would only be used if the Government of Samoa funds were used for project expenses rather than expenditure being through the Designated Account. Special commitments may be needed if goods are purchased from overseas. Required supporting documentation for disbursements will be outlined in the Disbursement and Finance Instructions Letter (DFIL).

12. **Designated Account.** The Project will utilize a Designated Account (DA) for advances and it will be managed by MOF ACMD. MOF will establish a project DA with CBS. For monitoring and reporting, a designated General Ledger code in the Finance One System will be linked to and maintain distinct project accounts. These accounts will physically reside in a single, centralized Project DA within the treasury account at the CBS. The maximum balance (ceiling) of the DA will be specified in the Disbursement and Financial Information Letter (DFIL).

Table A1.2. Eligible Expenditures

Category	IDA Grant Amount of Grant Allocated (Expressed in SDR)	IDA Grant Amount of Grant Allocated (Expressed in US$ equivalent)	Percentage of Expenditures to be Financed. (Inclusive of Taxes)
(1) Goods, works, consulting services, non-consulting services, training and workshops, and operating costs, for Parts 1.2, 1.3 , 2 and 3 of the Project.	8,060,000	10,850,000	100%
(2) Goods, works, consulting services and non-consulting services under Part 1.1	6,840,000	9,200,000	100%
TOTAL AMOUNT	14,900,000	20,050,000	

Table A1.3. Funding Sources

Source	Amount (Expressed in SDR)	Amount (Expressed in US$ equivalent)	Share of Total (%)
World Bank – National IDA Grant	14,900,000	20,050,000	100%
Total	14,900,000	20,050,000	100%

13. **Retroactive Financing:** No retroactive financing is envisaged.

Procurement Management

14. **Applicable Procurement Procedures:** Procurement will be carried out in accordance with the Bank's Procurement Regulations for Borrowers for Goods, Works, Non-Consulting and Consulting Services and applicable to Investment Project Financing (IPF) hereinafter referred to as "Regulations" dated September 2023. **The** World Bank standard procurement documents would be used for all procurement under international competitive procurement activities. The Project will use a web-based procurement tracking system, STEP, to communicate procurement review requests with the Bank.

15. **Implementing agency assessment and support plan:** MCIT has no prior experience of implementing World Bank financed project procurement and limited staff to implement the project procurement activities. MOF's central unit (CTSSU) international consultant will provide hands holding support to both agencies to ensure compliance

with the agreed procurement procedures. MCIT, the implementing agency, will also recruit a national procurement officer who will assist with the project procurement.

16. **Procurement reviews and supervision.** The Bank's prior and post reviews will be carried out based on thresholds defined by the project/contract risk. The Bank will carry out implementation support missions every six months and annual post-procurement reviews.

17. **PPSD and Procurement Plan:** MCIT prepared the PPSD and Procurement plan. The current draft Procurement Plan outlines 24 activities estimated at USD 9.62 million. The World Bank team and MCIT discussed the advance procurement arrangement and identified the ten advance procurement activities estimated at USD 3.03 million, to be started before the project effectiveness.

Table A1.4. Procurement by Category and Planned Sign Contract Year

Category	#	Estimated Amount (USD)
Goods and Non-Consulting Services	7	4,050,000
Civil Works	2	600,000
Consulting Services - Firm	8	3,790,000
Consultancy Services - Individuals	7	1,180,000
Year		
2024 – advance procurement activities	10	3,030,000
2025	5	3,940,000
2026	9	2,650,000
Grand Total	**24**	**9,620,000**

18. **Risk Assessment and Proposed Mitigation Measure.** The procurement risk associated with the Project, as described below, is rated *Substantial*. These risks should be closely monitored as they can adversely impact project implementation. The risk assessment will continue to be carried out during project implementation and adapted accordingly. The main procurement risks are summarized below:

Table A1.5. Main Procurement Risks

Risk	Mitigation Measure	Risk Owner
MCIT and OoTR does not have sufficient staff to undertake procurement effectively	• MCIT to hire sector coordinator, ICT expert and PMU consultants to efficient support the project procurement implementation. • CTSSU will provide hands-on and proactive procurement support to MCIT for the duration of the Project.	MCIT and OoTR
Unclear system of accountability with defined responsibilities and delegation of authority on who has control of project implementation (including procurement) decisions.	• MoF's CTSSU to provide training to all MCIT and OoTR personnel on approval processes such as the tender board approval, Attorney general approval process and timelines.	MoF's CTSSU
There is no robust oversight of procurement that provides timely and	• MCIT and CTSSU to provide quality assurance over procurement done by MCIT. CTSSU procurement	MoF's CTSSU

regular feedback e.g., through procurement audits.	consultant will undertake a formal "Quality Assurance Review" prior to the award of all prior review contracts	
Procurement delays may occur due to untimely technical inputs (e.g., TORs and detailed cost estimate) or due to lack of effective monitoring	• TOR and detailed cost estimate for 10 advance procurement activities to be finalized and start the procurement before the project effectiveness. • CTSSU to provide technical backstopping, which will include provision of technical inputs. • MCIT to monitor implementation of the procurement plan activities as loaded on STEP. • MCIT with support from the CTSSU , to prepare monthly procurement monitoring reports. Actions to expedite implementation are to be outlined when delays are identified. • CTSSU to continue to use the Procurement Efficiency KPI (Percentage of the Value of Contracts Procured on Schedule") and measure it on a quarterly basis. • CTSSU will deliver the procurement training to MCIT and OoTR	MCIT, OoTR and CTSSU
Relative purchasing power is low, and the target market does not perceive it as very attractive.	• MCIT and OoTR to carry out a market outreach for potential bidders/consulting firm for the FTTP procurement with an estimated cost of USD 9 million after completing the technical analysis.	MCIT, OoTR and CTSSU

Strategy and Approach for Implementation Support

19. The project will receive ongoing and regular implementation support. The support plan is based on previous experience in Samoa. The GoS, including the implementation agencies have experience with WB projects and are familiar with the procedures and requirements. Additional support will be provided through the CTSSU. Semi-annual reviews. MOF, in consultation with the IAs, will determine the appropriate timing of semi-annual reviews, taking into consideration the availability of participants. The WB implementation review will cover technical and non-technical aspects of the support including: (a) FM; (b) procurement; (c) implementation arrangements; and (d) safeguards. In addition, field visits will also be undertaken to verify work taken outside of city center. To the greatest extent possible, the WB team will accommodate any written request for 'as-needed' support for the Project, including fiduciary aspects. Each implementation review mission will result in the production of an aide-memoire that will be discussed at a wrap-up meeting to be chaired by MOF and attended by all IAs. The aide-memoire will provide an overall view of the current situation relating to project implementation, including findings and observations from the WB. Representatives from the relevant government departments will be invited to attend the wrap-up meetings. Any adjustment requiring more frequent reviews will be discussed, agreed upon, and documented in the Aide-Memoire. A mid-term review mission will be held not later than four years after the effective date, or such other period as may be agreed, and will provide an opportunity to review the Project and take stock of implementation progress. The Recipient shall prepare and furnish to the Bank, at least one month before the date of the mid-term review, a report, integrating the results of the monitoring and evaluation activities performed and, on the progress, achieved in the carrying out of the Project during the period preceding the date of such report and setting out the measures recommended to ensure the efficient carrying out of the Project and the achievement of the objectives. Following the mid-term review adjustments to project support may be

required, including a project restructuring and/or possible additional financing from any other sources based on the implementation experience. The World Bank team will work with MCIT and OoTR to clarify the requirements necessary to effect any changes. Any changes to the Project that require amendments to the Financing Agreement will require a formal request from the Government's signatory to the legal agreement.

Implementation support plan and resource requirements

20. **Missions to support Project implementation will be carried out every 3 – 6 months**. At least once per year the missions will include technical, fiduciary and safeguards team members, who will provide input into infrastructure design and implementation, carry out post reviews on contract management, review safeguards compliance, and provide formal training where required. The implementation support plan will be reviewed annually to ensure that it meets the support needs of the Project. The estimated level of annual support needed to implement the project is identified in the table below.

Table A1.6. Estimated level of annual support needed

Time	Focus	Skills Needed
First 12 months	• Hiring of the SCD • Assist in developing ToR/bidding documents for major activities and 'no objection' through STEP • TA for technical assessment to inform further activities under connectivity components • In-time support for speedy project implementation	• Task team leader • Technical specialists: Digital Development Specialist - connectivity (two or more), Digital Development Specialists - cybersecurity (one) • PPP transaction advisor • Lawyer • Telecommunications/ Network Engineer • Fiduciary specialists (FM/procurement and disbursement/M&E) • ESF specialists, including gender
Ongoing	• Ongoing technical support for all components • Fiduciary, environmental and social standards, and project management support	• As above

ANNEX 2: Gender Analysis

1. **The digital gender gap is noticeably evident according to the International Telecommunication Union (ITU)**[43]. Efforts to address and close the gender gap in mobile use have not been as successful as hoped[44] and it has not had the desired impact of improving productivity and growth. Research by GSMA found that closing the gender gap in mobile internet use across low- and middle-income countries over five years could deliver an additional USD 700 billion in GDP growth, while closing the gender gap in mobile ownership and use over the same period could deliver $140 billion in additional revenue to the mobile industry. Men globally are 21 percent more likely to be online than women, but this disparity rises to 52 percent[45]. This has serious implications for women's ability to benefit from developments in digital technology, which is especially problematic in a post-COVID environment that is increasingly reliant on online platforms for information sharing, services, and business opportunities.

2. **Gender gaps in economic opportunities persist in Samoa with women largely at a disadvantage.** The labor force participation for women was 41.1 percent compared to 66.3 percent for men in 2022[46]. While both increased over time, men's labor force participation increased faster in recent years. Only about 37 percent of paid employees and about 38 percent of persons in formal employment are women. Unemployment rates are higher for women compared to men at ten percent and seven percent, respectively; but the gender gap is larger among unemployed youth aged 15-24. Among those who are employed, there are some indications of gender gaps in hourly earnings, which persist within occupations and educational levels. Data from the 2017 Labor Force Survey show that nominal hourly wages for men are higher in seven of the nine main occupational categories. According to primary survey data collected for the purpose of a study[47], approximately 50-74 percent of 400 females interviewed reported using the internet to look for jobs, seek information, and voice their opinion on the internet[48]. Access to the internet outside of Apia has limitations, due to a combination of factors such as ready access to personal devices, substandard coverage, and the lack of digital skills training.

3. **Women in rural parts of Samoa, have lower levels of access to digital technology**. A recent survey by UNCDF indicated that 53 percent of Samoan male respondents and 46 percent of female respondents reporting cost savings on financial transactions as the result of using a digital channel. But without digital skills training, women are at risk of being left behind. Appropriate measures and improvements in technological skills for women in Samoa, will likely bring significant benefits to women. The Pacific Digital Gender Scorecards- Regional Synthesis Report recommends that Empowerment of Women and Girls Through Digital Skills and ICT Education to address digital gender gap through creating training programs specifically targeting women and girls with the aim to promote digital skills and to educate them on how they can use the internet to fully benefit from opportunities offered by digital technologies. Women constitute 30-40 percent of ICT related industry employees including in

[43] ITU (2021) Measuring Digital Development: Facts and Figures
[44] GSMA (2022) The Mobile Gender Gap Report
https://www.gsma.com/mobilefordevelopment/blog/the-mobile-gender-gap-report-2022/.
[45] World Economic Forum (2022) https://www.weforum.org/agenda/2022/03/how-to-close-digital-gender-divide/
[46] ILOSTAT in WB Gender Data Portal).
[47] Pacific Digital Gender Scorecards- Regional Synthesis Report
[48] Summary of Raw data collected for this project. Sample collection used the geographical sub regions from the Samoa Bureau of Statistics (SBS).

research developments and projects[49]. While approximately 65 percent of all schools have internet connectivity, the percentage of students' access to the internet at secondary schools is quite low, depending on limited resources which hinders internet accessibility[50]. Strategically executed training and awareness programs at the Fono Faavae, supported by enhanced connectivity supported by the Project would help significantly in bridging the access gap.

4. **The Government of Samoa views equal access to the internet and digital technologies for women and girls as a prerequisite and a critical enabler for ensuring delivery of universal healthcare, access to quality education, achieving financial literacy and to create more efficient and accountable public service delivery**. The Digital Samoa project through strategic investments in infrastructure (targeting especially the poorly served areas in the rural parts of Apia) , and the modernization of laws and regulations will seek to create an enabling and safe environment through which women and girls will have an increased and safe access to the internet and digital technologies. The Project would support such initiatives through improving access to the internet at the Fono Faavae (Community Development Centers) which would be used to deliver such trainings. Establishment of community Wi-Fi hotspots at such locations would help create a safe and conducive shared environment where women could congregate within their own villages to access internet and allow them to access digital financial services and empower them to grow their own business. Empowering women and girls by improving their access to digital technologies can benefit other aspects of their lives including education, employment, health as well as access to critical information they need. The national portal will include an application through which victims of gender-based violence and bullying will be able to reach authorities and support groups to access help. The same services will also be available for free at the Fono Faavae, thereby increasing the ease of access within a safe, secure and non-threatening environment.

5. **The Ministry of Health for example provides stakeholders with regular updated information on reproductive and sexual health rights and services for women and girls which can be accessed online**[51]. Growing evidence suggests that in developing economies increasing digital financial inclusion particularly payments, opens the door to engagement with the broader financial ecosystem which is associated with improved access to economic opportunities[52]. Increase accessibility to connectivity would enable women-led enterprise to work from the comfort and safety of their own community. Running a business from home also allows them to oversee any usual household responsibilities, saving time and money.

6. **The establishment of a Monitoring and Evaluation (M&E) system supported by the Project will allow the Government and the OoTR to standardize the collection of data, including disaggregated data according to gender to better inform interventions.** Decision makers need gender disaggregated data to create policies that address the specific needs of women and tackle the digital gender divide. The enhanced ability of Government to collect gender specific data will also help inform future Government policy directions, based on current usage trends. As such the M&E system will be a critical tool in identifying areas of gaps and articulating remedial measures in addressing them.

[49] NUS ICT courses enrollment (Semester 1 - 2022). https://www.mesc.gov.ws/
[50] National Information and Communication Technology in Education Policy (2018 - 2023) https://www.mesc.gov.ws
[51] https://www.health.gov.ws/
[52] Klapper, L et. Al. (2022). Women and Financial Inclusion. The Global Findex Database 2021.

7. **The Project supports the review of laws Government must review, enforce, and increase awareness on guidelines for law enforcement agencies to deal with issues where ICT tools are used to commit acts of GBV.** Women and girls face disproportionate risks to their data rights online, particularly in the form of online abuse, harassment and threats of violence. This means that violation of women's personal data rights can have an outsized impact on their other human rights, like freedom of expression, assembly, and psychological and physical safety. Both governments and companies have a role to play in helping to keep people safe by protecting the right to privacy — which makes the web safer for women, and for everyone. Data protection principles, including law and good practices, are currently considered, and implemented through increased gender-based violence (GBV) awareness programs, due to the advocacy efforts of the Ministry of Women, Community Social Development government partners, non-governmental organizations, and civil society.

8. **Finally, the Project will support the operationalization of the National Digital Identification**, in particular laying down the foundational infrastructure on which the NDID system will be made accessible via the SNBH to citizens across the country which will contribute to both improving access to credit and public services, including social assistance. Women currently face time and mobility constraints to accessing public services, due to social norms, making digital options more equitable. National Digital Identification will provide an easier avenue for women, especially from rural and remote communities, to access social assistance benefits and health services. Digital identifications will also promote women's access to online financial and business services (e.g., business licensing and collateral registration). Progress will be monitored by measuring the: Share of eligible population who have registered for a national digital identification (half of the digital identification owners are women).

ANNEX 3: Project Economic and Financial Analysis

1. **Following the relevant World Bank's OPCS guidelines, this Economic and Financial Analysis (EFA) measures the efficiency of the Digitally Connected and Resilient Samoa Project.** The EFA is based on a cost-benefit analysis that assesses the Project's expected stream of revenues and costs, and the net impact generated on the economy, by the proposed IPF of US$20.05 million to the Independent State of Samoa. The efficiency of the Project includes two specific analyses that measure: (i) the *financial rate of return and related NPV*, which capture the profitability – whether financial returns cover project costs – of the Project from the point of view of the World Bank and the relevant government entities in charge of project implementation; and (ii) the *economic rate of return and related NPV*, which measure the overall welfare impact of the Project – whether Samoa's resources are being used efficiently – from the standpoint of the Samoan society. The analyses are based on a comparison of with-project and without-project scenarios and returns. The general assumption is that any incremental profitability or benefits included in the analyses need to be attributable to the project interventions. To the extent possible, the analyses consider the scope and cost of the full Project being supported, not just the amount and scope of Bank financing.

2. **The results are necessarily indicative, as the analyses use average parameters extrapolated from existing data for Samoa as well as findings from the economic literature.** While the assumptions are based on the project team's discussions with government agencies, private telecom operators, and potential beneficiaries, as well as on results from other projects and findings from the economic literature, the EFA results are not precise representations of the impact that the Project will have, as a comprehensive analysis would include all direct and indirect revenues, economic benefits, and costs associated with changes in profitability and economic welfare that arose from the Project. However, quantifying many of these benefits and costs depends on the availability and reliability of data, which is limited for Samoa. The average parameters used to estimate the economic impact of the project components on the intended beneficiaries are inferred from the economic literature, offering the order of magnitude rather than delivering a precise impact estimate. The resulting estimated are thus indicative, particularly at this stage in the project cycle, when different scenarios of the entity in charge to build and operate the upgraded and extended fiber network are still being discussed with the government and will be further clarified with the feasibility study to be conducted under subcomponent 2.1..

3. **The analyses compare two scenarios where the private sector may or may not participate in the Project.** In the *base scenario*, the GoS will lend US$9.2 million to a newly formed company ("NewCo"), which would likely be an SPV fully controlled by the government or a government entity (100 percent debt financing), and which will oversee upgrading, extending, and operating the fiber network (subcomponent 1.1). This structure allows the government to maintain full control over the Project while separating some of the Project's financial risks and liabilities from the GoS' other operations. In the *alternative scenario*, one or more private sector operators will enter a PPP with an additional US$ 3.5 million. This figure is an estimate, and it may change as the dialogue with the government and the private sector proceeds and the feasibility study becomes available (see subcomponent 2.1). In the resulting PPP structure, the equity contribution would distribute some financial risks between the GoS and the private sector. The legal structure of NewCo, including whether it will involve private capitals from local operators, and the level and type of their participation to NewCo, has not been agreed upon yet. In order to capture the uncertainties at this stage in the project cycle, the EFA computes the financial and economic NPVs

and IRRs under both *base* and *alternative scenarios*, which reflect how conducive the assumptions are to long-term cost savings and efficiency gains. Finally, data collection, quality, and availability are also a function of the results framework set up during the project design, and the related theory of change.

4. **The financial and the economic analysis for the overall Project are performed under two different investments scenarios affecting the fiber network (subcomponent 1.1) only.** The *base scenario* assumes that the GoS will invest US$9.2 million in NewCo (subcomponent 1.1). Once operational costs and debt servicing are covered, the excess revenues are allocated to the GoS as the ultimate owner and financier. Assumptions related to the other Project subcomponents remain constant. In the *alternative scenario,* in addition to the GoS's investment (US$9.2 million in debt) for the fiber network (subcomponent 1.1), one or more private sector operators will enter into a PPP agreement with additional financing (US$3.5 million). Also in this scenario, the assumptions related to the other subcomponents remain constant. The feasibility assessment (subcomponent 2.1) will inform the final decision on the legal and operational characteristics of NewCo. A key consideration will be to align the wholesale pricing structure of the fiber network with the ITU's target of affordability, defined as broadband costs below 2% of GNI per capita. Ideally, the projected ARPU (Average Revenue Per User) and wholesale pricing would be designed to reflect market-competitive rates that not only cover operational and capital expenditure, but also meet ITU's affordability targets. This would ensure that the expanded network remains accessible to end users, particularly in Samoan rural areas, without compromising on the financial sustainability of the Project.

(i) Financial Analysis

5. **Under the *base scenario*, the financial analysis returned a Net Present Value (NPV) of US$1.4 million and an Internal Rate of Return (IRR) of 12 percent over a 20-year timeframe, considering a discount rate of 10 percent.** This analysis assesses the viability and sustainability of the Project from a financial standpoint, accounting for the Project's estimated direct and indirect costs and revenues under the *base scenario*'s assumptions. The following paragraphs detail the assumptions and caveats considered in estimating the financial costs and revenues and their variations in the *base* and *alternative scenarios*, the methodology used to calculate the financial NPVs and IRRs, and the sensitivity analysis adopted to reflect different levels of project-related risks.

6. **Project, Overall Assumptions**
   - 20 years: timeframe of the analysis (2025-2044);
   - Km 700: length of planned upgraded/extended fiber network in Upolu (km 400) and Savai'i (Km 300) under subcomponents 1.1 and 1.2;
   - Sensitivity analysis: the estimated rates of return and related NPVs are weighed on the risk assumptions made during this phase of the project cycle and reflect in the SORT section above (Systematic Operations Risk-Rating Tool), and the discount rates used are in the range of 8-12 percent. In alignment with World Bank guidelines, the sensitivity analysis uses the following discount rates: 8 percent (low-risk projects: stable, government-backed projects with predictable outcomes), (*medium-risk projects*: a middle-ground rate reflecting moderate risk), and 12 percent (high-risk projects with significant uncertainty or in high-risk areas);
   - Costs are discounted as follow: 25 percent on 1st year, 50 percent on 2nd year, 75 percent on 3rd year (estimated full costs are computed from 4th year onward);

- Forecasts for GDP, GDP per capita, and population are made with simple time series forecasting (i.e. exponential smoothing).

7. **Project Financial Costs, Assumptions**
   - In every Project component, the upfront investment costs (CAPEX) are equal to those estimated in the project budget;
   - In subcomponent 1.1, the GoS is expected to make the CAPEX investment in the *base scenario*, while one or more private operators will make an additional equity investment estimated as US$3.5 million in the *alternative scenario*; the future costs to operate (OPEX) is estimated from the price that Vodafone quoted to operate km 350 per year (WST 750,000 per year) and they include the cost to operate the submarine cable between Upolu and Savai'i (US$30,000 per year, source: SSCC); future costs for maintenance and assets replacement are estimated at 10 percent of CAPEX per year, in addition to the costs for the annual lease of the software to manage the active components (15 percent of active components; source: Team); these costs are discounted by 23 percent in the *alternative scenario*, as the private sector is expected to provide operational efficiencies;
   - In subcomponent 1.2, the GoS is expected to make the CAPEX investment, as per the project budget, while the OPEX and other costs are assumed to be included in the respective categories of subcomponent 1.1;
   - In subcomponent 1.3, all recurrent costs per year are estimated as 15 percent of CAPEX (source: Team);
   - Contingency costs are estimated at 10 percent of CAPEX in both scenarios, and they are meant to capture all unknown events, including natural disaster, technical challenges, and currency fluctuations.

8. **Project Revenues, Assumptions**
   - In subcomponent 1.1 and 1.2, the analysis includes the following ***revenue channels***:
     - *Revenues (wholesale) from leasing dark fiber to mobile operators and EPC:* at WST 1 per meter per month (approximately USD 0.37; source: Digicel), in both scenarios Digicel will lease km 650 of fiber backbone, Vodafone km 270, and EPC (Electricity Power Corporation) km 160;
     - *Revenues (wholesale) from leasing lines to government entities:* in the *base scenario*, a small number of entities (12 Fono Faavae) will lease the line at WST 400 per month (approximately US$149; source: Digicel); in the *alternative scenario*, one third of government agencies will lease the line, i.e. 7 health clinics, 70 schools, and 10 government agencies, in addition to all 51 Fono Faavae, as the private sector participation is expected to increase reach and, accordingly, revenue generated;
     - *Revenues from loan to NewCo:* the government lends the financing received from the World Bank to NewCo to build and manage the upgraded and extended fiber network; the terms of the loan are highly concessional: 20 years, 1 year grace period on capital repayment (but interest payments will be due from the year after the start of the Project), 1 percent interest rate; in both scenarios, NewCo is expected to service the debt (as it generates revenues).
   - In subcomponent 1.3, there are no revenues expected from broadband pilots nor the new data center.

9. Based on these assumptions and those specified in the following section, Table A3.1 below summarizes the financial and economic projections for the Project under the *base* and the *alternative scenarios* and levels of risk, while Tables A3.3 and A3.4 at the end of this Annex provide the yearly and cost breakdown for the *base scenario*.

Table A3.1. Financial and Economic Projections

Scenario	Discount rate	Financial NPV (million, US$)	Financial IRR	Economic NPV (million, US$)	Economic IRR
Base scenario (NewCo)	8%	3.38	**12%**	15.25	**29%**
	10%	**1.41**		**11.66**	
	12%	(0.05)		8.89	
Alternative scenario (NewCo w/PPP)	8%	4.90	**13%**	48.64	**66%**
	10%	**2.45**		**40.57**	
	12%	0.62		34.02	

Source: World Bank calculations

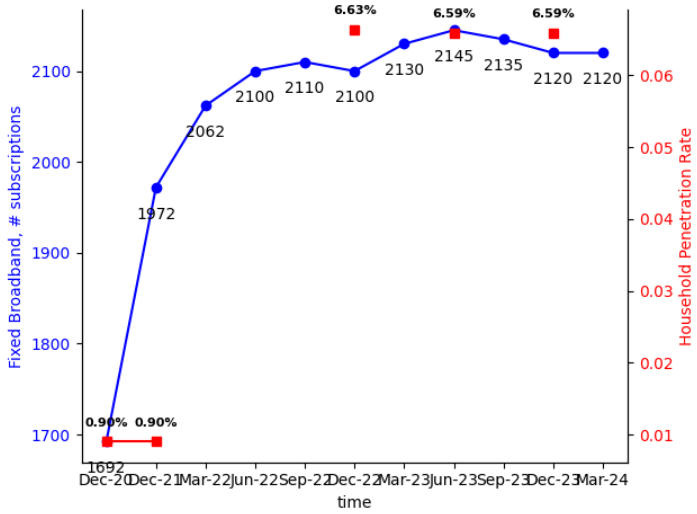
(ii) Economic Analysis

10. **Under the *base scenario*, the economic analysis returned a Net Present Value (NPV) of US$11.7 million and an Internal Rate of Return (IRR) of 29 percent over a 20-year timeframe, considering a discount rate of 10 percent.** This analysis evaluates the broader economic impact of the Project on Samoan society, focusing on benefits and costs not captured at the financial level. The Project is expected to improve the delivery of public services by leveraging better digital government tools, leading to greater efficiency and effectiveness in government operations and budget, in addition to stimulating economic growth with the introduction of new government portals (e.g. education, health). In the *alternative scenario*, the fixed broadband penetration is expected to increase, as the Project has additional funding to expand the market reach and attract more customers. The paragraphs below detail the assumptions and caveats considered in estimating the economic costs and benefits in the *base* and *alternative scenarios*, the methodology used to calculate the economic NPV and IRR, and the sensitivity analysis adopted according to different levels of project-related risks.

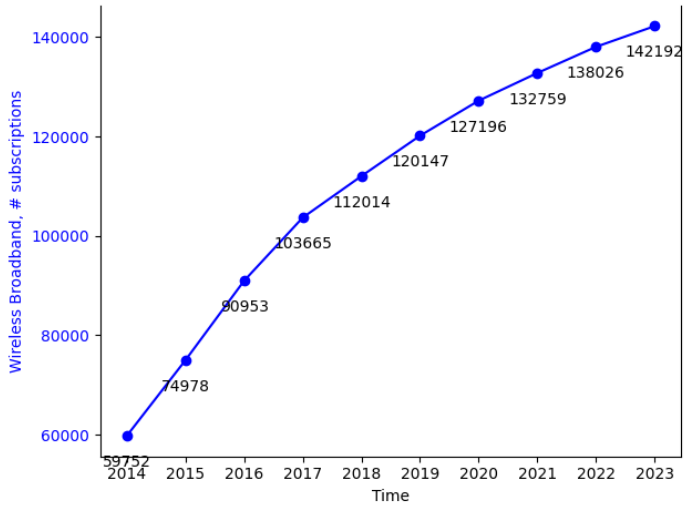
11. **Project, Overall Assumptions**
    - They include all the overall assumptions considered in the financial analysis (see above);
    - Multipliers: when estimating the model parameters, the uncertainties related to the external validity of the studies considered from the economic literature leads to an approximation of the potential channels of impact, showing the order of magnitude rather than delivering precise estimates;
    - The telecom market in Samoa has encouraged the expansion of mobile broadband connectivity across the islands – in 2023, there were about 142,000 wireless broadband subscriptions but only 2,120 fixed broadband subscriptions for a population in Samoa of 226,000 people (see Table A3.2 below). This trend will probably continue in the future, and the Project focuses on upgrading and extending the existing fiber network, with limited positive impact on economic growth.

Table A3.2. Subscriptions, Fixed Broadband and Wireless Broadband, Samoa

(a) Fixed Broadband subscriptions and Household penetration rate



(b) Wireless Broadband subscriptions



Source: World Bank calculations using (a) Subscriptions data from TeleGeography, except for 2020 (ITU); population data from WDI; household data from Samoa Bureau of Statistics. (b) Subscriptions data from GSMA.

12. **Project Economic Costs, Assumptions**
    - They include all assumptions related to financial costs considered in the financial analysis (see above);
    - The Project is not expected to lead to negative externalities for Samoa's society, hence there are no additional economic costs.

13. **Project Economic Benefits, Assumptions**
    - They include all assumptions related to project revenues considered in the financial analysis (see above);
    - The Project is expected to lead to positive externalities for Samoa's society, henceforth described;
    - For all components, this economic analysis has modeled the following channels of economic impact:
        - *Savings for government budget from operational efficiencies.* 5 percent reduction of government's transaction costs. In the *base* and *alternative scenarios*, subcomponents 1.1 and 1.2 are expected to improve the delivery of public services, leveraging digital government tools to achieve greater efficiency and effectiveness. The savings in the analysis are calculated at 1.5 percent reduction in the overall transaction costs and processing time for public services, which is estimated at 5 percent based on two United Nations studies, which calculate transaction costs in Small Island Developing States as 1.5-3 percent of GDP (these studies include costs for processing public services and administrative costs, but exclude costs related to personnel and infrastructure maintenance).[53] Two other industry studies show that specific ICT-related investments can lead to 20-30 percent cost reductions over time due to improved

[53] UNDP, "Public Administration Reform: Improving Public Sector Performance in Small Island Developing States," 2015; UNDP, "Small Island Developing States," 2023.

efficiencies, reduced manual processing, and better resource utilization.[54] However, the two main islands of Upolu and Savai'i are relatively small. In Upolu, the average time to travel by car to the capital city of Apia is 50', while the average travel time from the most rural areas is about 70'. The average travel time from the most rural areas of Savai'i to Apia by car is about 3.5 hours. Considering that approximately 75 percent of the population lives on the island of Upolu, this analysis estimates a smaller reduction in cost savings of 5 percent of overall transaction costs. Subcomponent 1.3 will probably generate additional savings if the government migrates the data center to the cloud, which could be done at a later stage;

- *Economic growth from broadband penetration.* For subcomponent 1.1, the *alternative scenario* includes the economic benefits resulting from the extended and upgraded fiber network. Several country-specific and cross-country studies have estimated the impact of an increase in fixed or wireless broadband penetration (typically, by 10 percent) on economic growth. Almost every study, despite the methodology, finds a positive economic impact from fixed broadband. However, the results are sometimes not statistically significant (particularly for low-income countries). There appears to be agreement in most studies that the impact is only noticeable after a certain threshold of broadband penetration, though the exact level remains variable.[55] In the *alternative scenario*, this analysis operationalizes the findings to date by assuming that four years after the reform, 1 private operator will offer fixed broadband subscriptions or leasing the bitstreams to ISPs (e.g. Computer Services Limited); demand for new subscriptions will be 1 percent of the population of Samoa; and that an increase of 10 percent in demand will lead to an increase of 0.5 percent in GDP per capita. The *base scenario* does not include these benefits since at this stage in the project cycle there are still significant uncertainties about the responsibility of deploying last-mile connections to households and businesses, in the absence of a PPP. Additionally, it is not clear whether there would be sufficient demand. In fact, based on the current telecom market structure, and the specific geographic characteristics of the country, Samoans lean on accessing broadband connectivity via wireless rather than fixed network, and demand for the latter is not expected to change. As Table A3.2 above shows, data for fixed broadband penetration rate in Samoa has been flat at about 2,000-2,100 connections since 2021, covering about 6.6 percent of households; on the other hand, the number of wireless broadband connections has increased steadily during the past ten year at over 10 percent CAGR (Compound Annual Growth Rate), reaching over 142,000 connections in 2023;
- *Economic growth from improved eGovernment.* In the *base* and *alternative scenarios*, the upgrade and expansion of the government's intranet is expected to streamline communications across all government agencies during crises and improve daily operational efficiencies, improving the delivery of services to the public. Additionally, the extension of the fiber network in previously unserved or underserved

[54] Deloitte Insights, "Budgeting for Digital Transformation: Why the Best Laid Plans Often Go Awry," Deloitte Development LLC, 2020; Gartner, "IT Key Metrics Data 2022: Key Industry Measures: Public Sector Analysis," 2022.

[55] Several cross-country studies conducted by the ITU show consistent average impacts of an Increase of 10 percent in fixed broadband penetration on GDP per capita. The latest study (ITU, 2021) quantified the average impact on GDP per capita in Asia-Pacific countries of 1.53 percent in high-income countries, but none on low- and middle-income countries. A 2016 study on 86 countries found an impact of 1.19 percent in GDP per capita in high income countries and 1.35 percent in middle- and low-income countries, and it used the same methodology used by an earlier World Bank study in 2009 where the impact results were 1.21 and 1.38, respectively (Scott, 2012; Qiang et al, 2009). These assessments only considered the benefits coming from an increase in penetration rate on the total population, and not the qualitative aspects of broadband growth. An OECD study identified significant and positive impacts on GDP when upgrading from a slow copper-based broadband connection to a high-speed Fiber to the Home (FTTH) connection. As the speed grew from 0.75 Mbps/s in 2002 to 12.85 Mbps/s in 2016, the GDP in the OECD region increased by 1.32 percent (Koutroumpis, 2019).

communities in Upolu and Savai'i could increase the productivity of public agencies, schools and hospitals connected to the network. Increasing broadband penetration in rural areas is likely to spur income-generation activities,[56] and evidence from low-income countries at the household level shows the positive influences of ICT infrastructure on inclusive growth in rural areas.[57] This analysis uses the findings from a study that shows how 1 percentage point increase in the United Nations' E-Government Development Index (EGDI) is associated with 0.14 percent increase in GDP per capita growth in Asian Countries (yearly, 2003-2015), and it assumes that after the upgrade and extension of the network, and the introduction of government online service, Samoa will improve the EGDI by 10 percentage points (and reach the same EGDI of Tonga, among the best performing country in the region);58

  - *Economic losses and disruptions averted.* Upgrading the datacenter and the fiber network, in addition to cybersecurity-related reforms (subcomponent 2.2), could lower the economic losses stemming from the existing, outdated infrastructure, including from less cyber incidents. A forthcoming World Bank study finds that one additional cyber incident is correlated with a decrease in GDP per capita of US$2.4-2.7 (excluding high-income countries). According to MCIT, recently there was only one major ransomware attack in Samoa (2021), so the analysis does not include this economic benefit.
- For subcomponent 1.3, the analysis does not estimate economic benefits;
- Additionally, investments under the Digitally Connected and Resilient Samoa Project may facilitate further investments from other donor funds or from the private sector, which have not been included in the analysis, and which could further increase economic returns.

See Table A3.1 above for a summary of the economic projections for both the *base* and the *alternative scenarios*.

[56] Xie et al, "Does digital inclusive finance promote coastal rural entrepreneurship?" in Yang et al, "Global Topics and New Trends in Coastal Research: Port, Coastal and Ocean Engineering," Journal of Coastal Research, No. 103, 2020.

[57] Nchake et al, "Investment in ICT infrastructure and inclusive growth in Africa," Scientific African 17, 2022; Xun et al, "Digital economy, financial inclusion and inclusive growth," China Economist 15, No. 3, 2020.

58 Majeed,M.T., Shah, A., (2018). An Empirical Analysis of Economic Performance of Asian Economies: The Role of Electronic Government. Review of Economics and Development Studies, 4 (1), 91-102.

Table A3.3: Financial Projections: Estimated Project Costs and Revenues, Base Scenario (SPV, 100 percent debt financing), 10 percent Discount Rate, US$, yearly.

	Project Component	Type of Cost / Revenue	Description	*Parameter*	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Project Costs (US$)	1.1-1.2	Direct	CAPEX	*13,220,000*	1,318,703	1,978,055	4,615,461	2,637,406	2,307,731	362,643	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1-1.2	Direct	OPEX	*589,566*	147,392	294,783	442,175	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566
	1.1-1.2	Direct	Future recurrent maintance and assets replacement costs	*1,397,000*	349,250	698,500	1,047,750	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000
	1.1-1.2	Direct / indirect	Future direct/indirect support (e.g. operating subsidy)	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*1,815,345*	*2,971,338*	*6,105,386*	*4,623,972*	*4,294,297*	*2,349,209*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*	*1,986,566*
	1.3	Direct	Costs for broadband pilots	*1,000,000*	99,751	149,626	349,127	199,501	174,564	27,431	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.3	Direct / indirect	All other recurring costs	*150,000*	37,500	75,000	112,500	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
				Subtotal	*137,251*	*224,626*	*461,627*	*349,501*	*324,564*	*177,431*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*
	1.4	Direct	CAPEX	*2,850,000*	284,289	426,434	995,012	568,579	497,506	78,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.4	Direct	All other recurring costs	*427,500*	106,875	213,750	320,625	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500	427,500
				Subtotal	*391,164*	*640,184*	*1,315,637*	*996,079*	*925,006*	*505,680*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*	*427,500*
	2.1	Indirect	Capacity building for digital economy	*2,000,000*	199,501	299,252	698,254	399,002	349,127	54,863	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.2	Direct / indirect	Enhancement of Cybersecurity	*350,000*	34,913	52,369	122,195	69,825	61,097	9,601	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*234,414*	*351,621*	*820,449*	*468,828*	*410,224*	*64,464*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	1.1-2.2	Opportunity	Lost benefits as GoS implements this project as opposed to others	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1-2.2	Intangible	Contingecy costs	*1,942,000*	155,360	155,360	155,360	155,360	155,360	77,680	77,680	77,680	77,680	77,680	77,680	77,680	77,680	77,680	77,680	155,360	155,360	155,360	155,360	155,360
				Total	**2,733,534**	**4,343,129**	**8,858,459**	**6,593,740**	**6,109,451**	**3,174,464**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,641,746**	**2,719,426**	**2,719,426**	**2,719,426**	**2,719,426**	**2,719,426**
Project Revenues (US$)	1.1-1.2	Direct	Estimated annual revenues (leasing to operators)	*4,024,845*	1,006,211	2,012,422	3,018,634	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845
	1.1-1.2		Estimated annual revenues (leasing to govt. entities)	*28,650*	7,162	14,325	21,487	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650	28,650
	1.1-1.2	Indirect	Estimated annual revenues from loan to NewCo	*Interests*	132,200	130,837	125,253	118,305	111,358	104,411	97,463	90,516	83,568	76,621	69,674	62,726	55,779	48,832	41,884	34,937	27,990	21,042	14,095	7,147
				Principal	0	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737	694,737
	1.3	Direct	Revenues for broadband pilots	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Total	**1,145,574**	**2,852,321**	**3,860,111**	**4,866,536**	**4,859,589**	**4,852,642**	**4,845,694**	**4,838,747**	**4,831,799**	**4,824,852**	**4,817,905**	**4,810,957**	**4,804,010**	**4,797,063**	**4,790,115**	**4,783,168**	**4,776,221**	**4,769,273**	**4,762,326**	**4,755,378**
Net Revenues = Revenues – Costs					1,587,960	1,490,807	4,998,349	1,727,204	1,249,861	1,678,178	2,203,948	2,197,001	2,190,053	2,183,106	2,176,159	2,169,211	2,162,264	2,155,317	2,148,369	2,063,742	2,056,795	2,049,847	2,042,900	2,035,952

Source: World Bank calculations

	Project Component	Type of Cost / Revenue	Description	Parameter	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Project Costs (USD) /*																								
Subcomponent 1.1: National fiber network to improve service delivery into underserved areas																								
	1.1-1.2	Direct	Upfront investment costs (CAPEX) -- GoS	*9,200,000*	917,706	1,376,559	3,211,970	1,835,411	1,605,985	252,369	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Upfront investment costs (CAPEX) -- PPP	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Direct	Future costs to operate (OPEX)	*589,566*	147,392	294,783	442,175	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566	589,566
	1.1-1.2	Direct	Future recurrent maintance and assets replacement costs	*995,000*	248,750	497,500	746,250	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000	995,000
	1.1-1.2	Direct / indirect	Future direct/indirect support (e.g. operating subsidy)	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*1,313,847*	*2,168,842*	*4,400,395*	*3,419,977*	*3,190,551*	*1,836,935*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*	*1,584,566*
Subcomponent 1.2: Enhancement of the capacity and coverage of the Government's Intranet																								
	1.2		Upfront investment costs (CAPEX) -- GoS	*2,640,000*	263,342	395,012	921,696	526,683	460,848	72,419	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*263,342*	*395,012*	*921,696*	*526,683*	*460,848*	*72,419*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Subcomponent 1.3 (a): Upgrade and establishment of secure and resilient government data center																								
	1.3	Direct	Upfront investment costs (CAPEX)	*2,950,000*	294,264	441,397	1,029,925	588,529	514,963	80,923	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.3	Direct	All other recurring costs	*442,500*	110,625	221,250	331,875	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500	442,500
				Subtotal	*404,889*	*662,647*	*1,361,800*	*1,031,029*	*957,463*	*523,423*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*	*442,500*
Subcomponent 1.3 (b): Support the rollout of broadband pilot(s)																								
	1.3	Direct	Costs for broadband pilots	*600,000*	59,850	89,776	209,476	119,701	104,738	16,459	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.3	Direct / indirect	All other recurring costs	*150,000*	37,500	75,000	112,500	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
				Subtotal	*97,350*	*164,776*	*321,976*	*269,701*	*254,738*	*166,459*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*	*150,000*
Component 2: Strengthening institutions and enhancing the enabling environment for the digital transformation																								
	2.1	Indirect	Transactional, Policy and Regulatory Support for PPP and Feasibility Assessment	*800,000*	79,800	119,701	279,302	159,601	139,651	21,945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.2	Indirect	Regulatory support, policy and legal framework for digital government and economy	*2,200,000*	219,451	329,177	768,080	438,903	384,040	60,349	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.3	Direct / indirect	Enhancement of Cybersecurity	*750,000*	74,813	112,219	261,845	149,626	130,923	20,574	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*374,065*	*561,097*	*1,309,227*	*748,130*	*654,613*	*102,868*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Component 3: Project implementation support																								
	3	Indirect	Capacity building for the digital economy	*910,000*	90,773	136,160	317,706	181,546	158,853	24,963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Subtotal	*90,773*	*136,160*	*317,706*	*181,546*	*158,853*	*24,963*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	1.1-2.2	Opportunity	Lost benefits as GoS implements this project as opposed to others	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1-2.2	Intangible	Contingency costs: current and future costs that are difficult to anticipate, measure, or quantify	*2,005,000*	160,400	160,400	160,400	160,400	160,400	80,200	80,200	80,200	80,200	80,200	80,200	80,200	80,200	80,200	80,200	160,400	160,400	160,400	160,400	160,400
				Total	**2,704,667**	**4,248,933**	**8,793,200**	**6,337,466**	**5,837,466**	**2,807,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,257,266**	**2,337,466**	**2,337,466**	**2,337,466**	**2,337,466**	**2,337,466**
Project Revenues (USD) /*	1.1-1.2	Direct	Estimated annual wholesale revenues (leasing to operators)	*4,024,845*	1,006,211	2,012,422	3,018,634	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845	4,024,845
	1.1-1.2	Direct	Estimated annual wholesale revenues (leasing to Govt. entities)	*21,487*	5,372	10,744	16,115	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487	21,487
	1.1-1.2	Indirect	Estimated annual revenue from loan to NewCo	Interest Payment	9,200	9,200	8,720	8,240	7,759	7,278	6,796	6,314	5,831	5,348	4,864	4,380	3,895	3,410	2,924	2,438	1,951	1,464	977	489
				Principal Repayment	0	479,867	480,347	480,827	481,308	481,790	482,271	482,754	483,236	483,720	484,203	484,687	485,172	485,657	486,143	486,629	487,116	487,603	488,090	488,579
	1.3	Direct	Revenues for broadband pilots	*0*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
				Total	**1,020,783**	**2,512,233**	**3,523,816**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**	**4,535,399**
Net Revenues = Revenues – Costs					1,683,884	1,736,700	5,269,384	1,802,067	1,302,067	1,728,133	2,278,133	2,278,133	2,278,133	2,278,133	2,278,133	2,278,133	2,278,133	2,278,133	2,278,133	2,197,933	2,197,933	2,197,933	2,197,933	2,197,933

Source: World Bank calculations

Table A3.4: Economic Projections: Estimated Project Costs and Benefits, Base Scenario (SPV, 100 percent debt financing), 10 percent Discount Rate, US$, yearly.

	Project Component	Type of Cost / Benefit	Description	Parameter	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Project Economic Costs (US$)	All	Direct-Indirect	Total Project Costs	*13,220,000*	2,733,534	4,343,129	8,858,459	6,593,740	6,109,451	3,174,464	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,719,426	2,719,426	2,719,426	2,719,426	2,719,426
	All	Indirect	Negative externalities for society:	*None*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Total	2,733,534	4,343,129	8,858,459	6,593,740	6,109,451	3,174,464	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,719,426	2,719,426	2,719,426	2,719,426	2,719,426
Project			Total Project Revenues		1,145,574	2,852,321	3,860,111	4,866,536	4,859,589	4,852,642	4,845,694	4,838,747	4,831,799	4,824,852	4,817,905	4,810,957	4,804,010	4,797,063	4,790,115	4,783,168	4,776,221	4,769,273	4,762,326	4,755,378
			Positive externalities for society:	*Yes*																				
	1.1-1.2	Indirect	Cost savings in national budget	*Improved operational efficiencies*	728,637	744,441	760,244	776,048	791,852	807,655	823,459	839,262	855,065	870,869	886,673	902,477	918,280	934,083	949,887	965,690	981,494	997,298	1,013,101	1,028,904
	1.1-1.2-2.1	Indirect	Increase in GDP	*Improved eGovernment*	113,475	232,418	356,917	487,061	498,352	509,762	521,291	532,939	544,706	556,592	568,597	580,720	592,963	605,325	0	0	0	0	0	0
	1.1	Indirect	Increase in GDP	*Higher fixed broadband penetration*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.4-2.2	Indirect	Averted economic losses and disruptions	*Data center, cybersecurity reforms*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Total	1,987,686	3,829,180	4,977,272	6,129,646	6,149,793	6,170,060	6,190,445	6,210,949	6,231,571	6,252,314	6,273,175	6,294,154	6,315,253	6,336,471	5,740,002	5,748,859	5,757,715	5,766,571	5,775,427	5,784,282
Net Benefits = Benefits – Costs					745,847	513,949	3,881,188	464,094	40,342	2,995,595	3,548,699	3,569,203	3,589,825	3,610,568	3,631,429	3,652,408	3,673,507	3,694,725	3,098,256	3,029,433	3,038,289	3,047,145	3,056,001	3,064,856

	Project Component	Type of Cost / Benefit	Description	Parameter	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Project Economic Costs (US$)	All	Direct-Indirect	Total Project Costs	*13,220,000*	2,733,534	4,343,129	8,858,459	6,593,740	6,109,451	3,174,464	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,719,426	2,719,426	2,719,426	2,719,426	2,719,426
	All	Indirect	Negative externalities for society:	*None*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Total	2,733,534	4,343,129	8,858,459	6,593,740	6,109,451	3,174,464	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,641,746	2,719,426	2,719,426	2,719,426	2,719,426	2,719,426
Project			Total Project Revenues		1,145,574	2,852,321	3,860,111	4,866,536	4,859,589	4,852,642	4,845,694	4,838,747	4,831,799	4,824,852	4,817,905	4,810,957	4,804,010	4,797,063	4,790,115	4,783,168	4,776,221	4,769,273	4,762,326	4,755,378
			Positive externalities for society:	*Yes*																				
	1.1-1.2	Indirect	Cost savings in national budget	*Improved operational efficiencies*	728,637	744,441	760,244	776,048	791,852	807,655	823,459	839,262	855,065	870,869	886,673	902,477	918,280	934,083	949,887	965,690	981,494	997,298	1,013,101	1,028,904
	1.1-1.2-2.1	Indirect	Increase in GDP	*Improved eGovernment*	113,475	232,418	356,917	487,061	498,352	509,762	521,291	532,939	544,706	556,592	568,597	580,720	592,963	605,325	0	0	0	0	0	0
	1.1	Indirect	Increase in GDP	*Higher fixed broadband penetration*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.4-2.2	Indirect	Averted economic losses and disruptions	*Data center, cybersecurity reforms*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Total	1,987,686	3,829,180	4,977,272	6,129,646	6,149,793	6,170,060	6,190,445	6,210,949	6,231,571	6,252,314	6,273,175	6,294,154	6,315,253	6,336,471	5,740,002	5,748,859	5,757,715	5,766,571	5,775,427	5,784,282
Net Benefits = Benefits – Costs					745,847	513,949	3,881,188	464,094	40,342	2,995,595	3,548,699	3,569,203	3,589,825	3,610,568	3,631,429	3,652,408	3,673,507	3,694,725	3,098,256	3,029,433	3,038,289	3,047,145	3,056,001	3,064,856

Source: World Bank calculations

ANNEX 4: Climate Annex

The following table elaborates on specific design climate change adaptation and mitigation measures that were included in the DCRS Project

Topography, coastal location, geographic region and socio-economic factors make Samoa both exposed and vulnerable to climate hazards. Climate emergencies are costly for Samoa[59]due to combination of environmental, climatic and socioeconomic elements of the national context. National digital connectivity that reaches to previously unconnected areas and communities is intended to be the key element in the climate adaptation and resilience framework. The intent of both Component 1 and Component 2, is to build climate-resilient digital and data infrastructure and provide uninterrupted digital connectivity and services that will enhance resilience of population, public sector, and economy overall

Sub-components / Activity	**Financing (US$ million)**	**Adaptation Measures**	**Mitigation Measures**
Component 1: Investments in Digital Connectivity and Digital Government Infrastructure (US$15.39 million) *This component will support the development of climate and disaster-resilient national digital connectivity infrastructure that aims to maximize the benefits of digital connectivity for public institutions, businesses, and citizens of Samoa.* *The component may mobilize private capital to optimize efficient allocation of resources and utilize private sector expertise to address bottlenecks in different parts of the digital connectivity value chain that has the largest impact on costs, competitiveness, and reliability of internet connectivity. Moreover, emphasis will be placed on directing investments toward green technologies (e.g. solar power) and cybersecurity of critical infrastructure. The project commits to obtaining EDGE certification.*			
Subcomponent 1.1 National fiber network to improve service delivery into underserved areas	9.20	This activity will upgrade and expand the disaster and climate resilient digital infrastructure to connect unserved or underserved (commercially unviable) communities in Upolu and Savai'i with FTTP using green technologies. The subcomponent will incorporate resiliency and redundancy in the network design to ensure robust and secure communications, including the use of public Wi-Fi hotspots to improve accessibility of ICT services to citizens in rural areas and serving as ad-hoc "resilience centers" where citizens can get access via hotspots to government services and resources following the adverse climatic events. The core and last mile network will enable emergency cash transfers for the citizens who experience climate-related emergencies. This will not only address bridging the digital divide but also increase the resilience of remote communities during emergencies such as epidemics (including of waterborne and water-linked vector-borne	Under this activity, the investments in new digital infrastructure including investments in redundancy for energy source will reduce energy consumption and CO2 emissions. The Project will support the decommissioning of inefficient legacy equipment and copper cables. For new equipment, best practices for energy efficiency and

[59] *"The Government of Samoa estimated flood-related damage costs to be approximately $70 million Tala, following the last major floods of December 2020."* https://www.undp.org/samoa/stories/dealing-flooding-capital

Sub-components / Activity	Financing (US$ million)	Adaptation Measures	Mitigation Measures
		etiology) and/or climate-related natural disasters. The design of the network will integrate weather-resistant materials, waterproof coverings, and where technologically and economically feasible – an underground infrastructure with climate-resilient design which would allow the digital infrastructure to withstand extreme weather events which are increasing in intensity and frequency due to climate change.	international standards, such as ITU-T recommendations with respect to energy efficiency, will be followed. Existing copper-based networks which are currently being used by some of the Government agencies outside of Apia to connect to the Government intranet will be replaced by energy efficient fiber optic networks, which are highly energy efficient, and which reduces GHG emissions[60]. The migration from a copper to a fiber optic-based access network is expected to significantly reduce energy consumption and GHG emissions. It is estimated that fiber optic networks save 40-60 percent of energy consumption compared to traditional copper-based networks. About 60% of the total investment in subcomponent 1.1 and 80% of the total investment in subcomponent 1.2 will comprise of replacing energy intensive copper with energy efficient fiber optics The remaining financing (40% in subcomponent 1.1 and 20% in subcomponent 1.2 will be greenfield energy efficient fiber
Subcomponent 1.2 Enhancement of the capacity and coverage of the Government's Intranet	2.64	This activity will finance the replacement of the Government's aging SNBH intranet leveraging the investments made in Component 1.2. The activity will support connecting more government agencies throughout Upolu and Savai'i to the new Government intranet network, as well as secure cross-government data and information exchange at the national level. Any copper-based network currently used for the purpose of supporting SNBH connectivity will be upgraded using energy efficient fiber networks. The upgraded network powered by green technologies, with backup and recovery plans, will serve as a critical infrastructure and provide an essential communication platform for all government agencies during crises or help coordinate responses in the aftermath of emergencies (including adverse weather events, like cyclones, storms, and floods). It will allow government agencies to exchange and cross-reference data for the newly established digital ID system, to be financed by a parallel WB's project, Samoa Finance Sector Resilience (P181456). The Government's Intranet system will permit the use of the digital IDs of the citizens to identify the citizens affected by climate emergencies and distribute emergency	

[60] Fiber Broadband Association, 2020. Access Network OpEx Analysis White Paper. Operational expenses for all-fiber networks are far lower than for other access networks. Moreover, a new study from the Prysmian Group, which was commissioned by cable manufacturer Europacable, has found that Fibre-to-the-Premises (FTTP) based broadband ISP networks are the most energy efficient of consumer fixed line technologies, compared with Fiber to the Cabinet (FTTC) very high-speed digital subscriber line 2 (VDSL2) and Hybrid Fiber Coax. Available at: https://www.ispreview.co.uk/index.php/2020/11/study-finds-full-fibre-is-the-most-energy-efficient-broadband.html. Numerous sources online, including engineering manuals, provide information on the differential in efficiency between fiber optic vs. Copper cables. Such, throughput of fiber optic cable can be up to 30 times higher than that of the copper cable, or more. Fiber optic networks can handle ten times more calls than copper-based legacy networks. Throughput in data transmission refers to the cable's ability to handle a specific data volume within a given time. For instance, some fiber optic cables can transmit up to 10Gbps, while copper cables manage only 25-300 Mbps. Hence, transitioning from copper-based to fiber optic cables delivers substantial reduction of life cycle ghg emissions and substantially increases the efficiency of resource use and infrastructure operation. ( )

Sub-components / Activity	Financing (US$ million)	Adaptation Measures	Mitigation Measures
		cash transfers, where needed. The subcomponent, through appropriate investments in technology, is expected to minimize network downtime, eliminate single point of failure (SPOF), and mitigate power cuts that negatively affect business continuity of government agencies, schools and hospitals, especially in the aftermath of adverse weather conditions.	optic[61]. All infrastructure and telecommunications equipment to be procured under this component will have energy efficiency levels that will surpass country's current energy efficiency levels and equipment procured for similar expansion projects. These will incorporate in the design renewable energy sources and follow internationally recognized best available energy efficiency performance and practices such as IEEE 802.3az and ITU-T Recommendation L. 1310. 8 [62].
Subcomponent 1.3 Upgrade and establishment of secure and resilient government data center and support the rollout of broadband pilots	3.55	This activity will upgrade and expand the existing Government data center for critical data, while providing an option of migrating to a cloud, including private Government cloud. The transition to the cloud will enhance the overall resilience of GoS's IT systems and reduce the risk of SPOF, especially during national emergencies and/or climate-related natural disasters, while minimizing the maintenance cost. For the critical data to be stored in the government data center, redundant backup for electricity, with usage of renewable energies will be explored to minimize network downtime, eliminate SPOF, and reduce the carbon footprint. Emphasize will be made to ensure the site of the data center is at an appropriate location, which will mitigate against	- The Project will support decommissioning legacy equipment and investing in more efficient technology. - Investments and procurement for new digital infrastructure and equipment include mandatory requirements for achieving energy efficient certification for equipment such as Energy Star that is the best available technology/energy efficient

[61] Without the World Bank's intervention and in a non-project scenario, the use of energy-intensive copper (instead of the modern energy efficient fiber optic cables) for broadband connectivity would be far more extensive in Samoa

[62] Samoa's minimum energy efficiency standards are set out in the Energy Management Act 2020 and the Energy Efficiency (Approved Energy Using Products Standards) Regulations 2018. IEEE Standard for Information technology - Local and metropolitan area networks - Specific requirements - Part 3: CSMA/CD Access Method and Physical Layer Specifications Amendment 5: Media Access Control Parameters, Physical Layers, and Management Parameters for Energy-Efficient Ethernet: https://standards.ieee.org/ieee/802.3az/4270/ & ITU Recommendation L.1310 on Energy efficiency metrics and measurement methods for telecommunication equipment: https://www.itu.int/rec/T-REC-L.1310/en?.

Sub-components / Activity	Financing (US$ million)	Adaptation Measures	Mitigation Measures
		losses caused by flooding and Tsunamis as this will be a critical Government infrastructure. The development of an improved data and cloud infrastructure, as well as Government Network allows digital delivery platforms and payment gateways, which will strengthen continuity of operations during weather-related to ensure continuity of service provision in the event of an emergency or climate disaster. The ability to store critical government data in a secure environment mitigates against risks of loss due to adverse weather impacts such as flooding and cyclones. The Government core systems will improve communications across key Government agencies and enable the deployment of disaster risk monitoring tools enhancing preparedness and response to extreme weather events, improve dissemination of early warnings to help mitigate against climate-related risks, including floods, improve damage assessment and response times to provide relief to citizens affected. This activity will help citizens of Samoa in utilizing the National Government Portal to access government services online and demonstrate the value of broadband connectivity through pilots. The subcomponent will pilot broadband use cases (subject to stakeholder consultations led by MCIT) to support: (i) state-owned broadcaster National Radio 2AP for delivering to the citizens timely emergency and resilient communications (including during adverse weather conditions like flooding and cyclones) through modernizing and expanding the transmission footprint through the use of modern and energy efficient FM transmission technology (ii) access to the National Government Portal in Fono Faavae for residents without devices to access information on government services	certification in the country[63]. The data center will achieve green data center certifications, such as EDGE Data center specification, Green Globes etc, - Cloud and datacenter investments will follow green procurement principles encouraging green design choices (cooling, energy efficiency) and consider best practices for energy efficient datacenters operations. The implementing agencies will be required to get information from the manufacturer that by following certain specifications and equipment, the energy consumption would reduce 20 percent or more. - The Project will also support the IAs to hire through a TA Energy auditors (for instance, EDGE certified specialist available for the specific country) to assist in meeting the 20 percent reduction in energy consumption from the baseline, and to help in getting the data center is edge certified. - Solutions will incorporate renewable energy sources like solar panels to reduce reliance on diesel generators and reduce GHG emissions. - Broadcasting equipment used for the expansion of the 2AP radio broadcast coverage will incorporate use of high energy efficient transmitters and antennas to reduce energy usage and the carbon footprint (see details under

[63] Samoa's minimum energy efficiency standards are set out in the Energy Management Act 2020 and the Energy Efficiency (Approved Energy Using Products Standards) Regulations 2018. The project will follow internationally recognized energy efficiency certifications such as Energy Star that will surpass national energy efficiency labeling standards

Sub-components / Activity	Financing (US$ million)	Adaptation Measures	Mitigation Measures
			subcomponents 1.1 and 1.2 for energy efficient equipment). The redundancy plans for the network will incorporate use of renewable energy solutions like solar into the design where possible to further reduce dependency on grid energy.
Strengthening institutions and enhancing the enabling environment for digital transformation (US$3.75 million) *This component will support capacity building for MCIT and OoTR and strengthen the enabling environment for digital government and digital economy of Samoa.*			
Subcomponent 2.2 *Regulatory support, policy and legal framework for digital government and economy*	2.2	The component will also support MCIT in conducting a review of outdated sector polices and legislations with a view to helping to establish policies and regulation for secure and resilient digital government and digital economy. This will also include an incorporation of a policy which will establish across the whole of Government, guidance on how to ensure digital infrastructure is designed to take climate change risks into consideration, for example building in areas that are not prone to climate inducted weather events, building with weather resistant materials, wider drains for flood management. The policy legislation will have a significant (30% or more) focus on both mitigation and adaptation. Other aspects that also contribute to climate adaptation/mitigation, would be, enhancement of competition, innovation (which would be making optimum use of available resources such as energy etc), asset management and sustainability policy (which include climate considerations) , equipment class licensing (use of energy efficient technologies) The policy will also include guidance on how to include renewable energy sources in the design of networks to help reduce energy disruptions that could be generated by impacts of weather events on the diesel transportation value chain. Investments in training and procurement of equipment, will be provides to OoTR to ensure they are able to monitor the operational efficiency of the networks and to ensure maximum	

Sub-components / Activity	Financing (US$ million)	Adaptation Measures	Mitigation Measures
		performance and coverage of services so that people continue to have access to services even during periods of adverse weather. The equipment procurement for OoTR and MCIT are essential in ensuring compliance of transmitting equipment to the parameters which ensure optimum energy efficiency of the transmissions	
Subcomponent 2.3 *Enhancement of Cybersecurity*	0.75	This subcomponent aims to strengthen the GoS's technical and institutional capacity in cybersecurity, providing a critical foundation for safeguarding digital infrastructure Any investments made into the computing hardware requirements and monitoring equipment of SAMCERT will incorporate climate-resilient design which would allow the digital infrastructure to withstand extreme weather events which are increasing under climate change. It is estimated that equipment to the value of $600,000 will be supported by the Project.	Any equipment required by SamCERT, that will be purchased through the Project, will follow energy efficiency standards and support the use of renewable energy source and standards including but not limited to EDGE certification and energy STAR labelled solutions. It is estimated that equipment to the value of $600,000 will be supported by the Project