

Document of
The World Bank

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PROGRAM APPRAISAL DOCUMENT

FOR A

REGIONAL ADAPTABLE PROGRAM LOAN

FOR A

PACIFIC REGIONAL CONNECTIVITY PROGRAM

July 29, 2011

Transport, Water and ICT Department
East Asia and Pacific Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2011)

Currency Unit = SDR
SDR = US\$1.60

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADSL	Asymmetric digital subscriber line
APL	Adaptable Program Loan
AusAID	Australian Agency for International Development
EA	Environmental assessment
EIA	Environmental impact assessment
EMP	Environmental management plan
ESIA	Environmental and social impact assessment
ESMF	Environmental and social management framework
FAIDP	Framework for Action on ICT Development in the Pacific
FMS	Financial management specialist
Gbps	Gigabits per second
GDP	Gross domestic product
GPRS	General packet radio service
ICT	Information and communication technologies
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim financial report
IRU	Indefeasible right of use
ITU	International Telecommunications Union
Kbps	Kilobits per second
LAN	Local area network
Mbps	Megabits per second
M&E	Monitoring and evaluation
PMU	Project management unit
PPP	Public-private partnership
PRIF	Pacific Region Infrastructure Facility
PRRRC	Pacific Regional Regulatory Resource Centre
RP	Resettlement plan
RFP	Resettlement framework plan
SCCN	Southern Cross Cable Network
TCC	Tonga Communications Corporation
TCL	Tonga Cable Ltd.
US\$/ USD	United States dollar

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PACIFIC ISLANDS
Pacific Islands: Regional Connectivity Program

CONTENTS

	Page
I. STRATEGIC CONTEXT AND RATIONALE	1
A. Regional and Sector Issues	1
B. Rationale for Bank Involvement.....	7
C. Higher Level Objectives to Which the Program Contributes	8
II. PROGRAM DESCRIPTION.....	9
A. Lending Instrument.....	9
B. Program Objective, Approaches and Phases	11
C. Program and Project Components	14
D. Lessons Learned and Reflected in the Program Design	15
E. Alternatives Considered and Reasons for Rejection.....	16
III. IMPLEMENTATION	17
A. Partnership Arrangements (if applicable).....	17
B. Institutional and Implementation Arrangements	17
C. Monitoring and Evaluation of Outcomes/Results.....	18
D. Sustainability.....	18
E. Critical Risks and Possible Controversial Aspects	19
F. Credit/Grant conditions and covenants.....	19
IV. APPRAISAL SUMMARY	20
A. Economic and Financial Analysis.....	20
A. Technical.....	22
B. Fiduciary	22
C. Social.....	23
D. Environment.....	23
E. Safeguard Policies.....	24
F. Policy Exceptions and Readiness.....	24
Annex 1: Country Background	25
Annex 2: Sector Overview by Country and Detailed Program Description	28

Annex 3: Results Framework and Monitoring	37
Annex 4: Program Implementation Arrangements.....	40
Annex 5: Documents in the Project File	43
Annex 6: Environmental and Social Management Framework	44
Annex 7: Maps.....	53

NOTE

This document is the Program Appraisal Document for the Pacific Regional Connectivity Program. It is complemented by Technical Annexes prepared for each country joining the Program at the time of its application for IDA financing.

PACIFIC ISLANDS

REGIONAL CONNECTIVITY PROGRAM

PHASE 1: TONGA/FIJI CONNECTIVITY PROJECT

EAST ASIA AND PACIFIC

TWICT

Date: August 10, 2011 Country Director: Ferid Belhaj Sector Manager/Director: Philippe Dongier Project ID: P113184 Lending Instrument: Adaptable Program Loan	Team Leader: Natasha Beschoner Sectors: General information and communications sector (100%) Themes: Rural services and infrastructure (50%); Infrastructure services for private sector development (25%); Regulation and competition policy (25%) Environmental category: Partial Assessment Joint IFC: Joint Level:
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Project Financing Data

Loan Credit Grant Guarantee Other:

For Loans/Credits/Others:

Total Bank financing (US\$m.): 17.20

Proposed terms: Standard IDA Grant terms

Financing Plan (US\$m)

Source	Local	Foreign	Total
BORROWER/RECIPIENT	0.00	6.60	6.60
International Development Association (IDA)	0.00	17.20	17.20
Asian Development Bank	0.00	9.70	9.70
Pacific Regional Infrastructure Facility Trust Fund	0.00	0.50	0.50
Total:	0.00	34.00	34.00

Borrower:

Kingdom of Tonga

Responsible Agency:

Ministry of Information and Communications

P.O.Box 1380

Tonga

Tel: +676 28 170 Fax: +676 24 861

Tonga Cable Ltd
 4 Patco Center
 P.O. Box 33
 Nuku'alofa
 Tonga
 Fax: +676 22444

Estimated disbursements (Bank FY/US\$m)

FY	2012	2013	2014	2015	2016				
Annual	2.00	3.00	5.00	5.00	2.20				
Cumulative	2.00	5.00	10.00	15.00	17.20				

Project implementation period: Start August 30, 2011 End: August 30, 2016

Expected effectiveness date: November 30, 2011

Expected closing date: August 30, 2016

Does the project depart from the CAS in content or other significant respects? Yes No
Ref. PAD I.C.

Does the project require any exceptions from Bank policies? Yes No
Ref. PAD IV.G.
 Have these been approved by Bank management? Yes No
 Is approval for any policy exception sought from the Board? Yes No

Does the project include any critical risks rated “substantial” or “high”? Yes No
Ref. PAD III.E.

Does the project meet the Regional criteria for readiness for implementation? Yes No
Ref. PAD IV.G.

Project development objective *Ref. PAD II.C., Technical Annex 3*

Pacific Regional Connectivity Program: The objective of the Pacific Regional Connectivity Program is to reduce the cost and increase the availability of international bandwidth for participating countries, and thereby facilitate the development of a wide range of ICT applications to support social and economic development in the Pacific region.

Phase 1. Tonga-Fiji Connectivity Project: The objective of the proposed Project is to improve the enabling environment for telecommunications and ICT in Tonga, including greater competition and increased access to infrastructure and services by reducing the costs of international connectivity and strengthening the telecommunications regulatory framework. Access to the capacity on this new infrastructure will be available on an open-access basis. Expected sector-specific outcomes are: (a) increased international connectivity; (b) improved enabling environment; and (c) increased access to ICT services.

Project description *Ref. PAD II.D., Technical Annex 4*

Component 1. Submarine Cable System (US\$32.6 million). This will include: (a) the construction of an 827 km repeatered cable linking Nuku'alofa (Tonga) with Suva (Fiji), and (b) a cable landing station in Tonga.

Component 2. Enabling Environment, (\$1.0 million) will finance technical assistance for the Ministry of Information and Communications (MIC) on (a) telecommunications policy, legal and regulatory development, licensing harmonization, and on the legal and regulatory environment for Internet and e-transactions, and (b) regulatory capacity building.

Component 3. Project Management and Administration (\$0.4 million) will provide administrative support to the Ministry of Information and Communications (MIC) in the areas of project management, procurement, financial management, communications strategy and audit.

The Project will be cofinanced by the Asian Development Bank (ADB), the World Bank the Pacific Region Infrastructure Facility (PRIF), and Tonga Cable Limited.

Which safeguard policies are triggered, if any? *Ref. PAD IV.F., Technical Annex 10*

Social

Overall, the Project is anticipated to have positive social impacts on communities by improving telecommunications capacity. The Project does not trigger OP 4.10 as there are no indigenous people in the project area. The Environmental Assessment/Environmental Management Plan (EA/EMP) completed for the Project highlights potential minimal impacts to communities as a result of the Project. As such the Project triggers OP 4.12, Involuntary Resettlement. The EMP will work to mitigate any livelihood impacts that arise, and a Compensation and Resettlement Framework (CRF) has been prepared to address these issues. The CRF was discussed with potentially affected communities in Tonga and Fiji, and disclosed publicly. It is important to note that no resettlement is expected as a result of the Project. The potential minimal impacts relate to livelihoods and include: (a) minimal damage to fishing grounds of customary Fijian owners; (b) fishermen in Fiji and Tonga may be affected by the laying of the cable for a short time (in Laucala Bay and Nukualofa, respectively), (c) minimal impacts to inshore fishing in Tonga and Fiji.

In the event of any resettlement and/or land acquisition impacts in either Fiji or Tonga as described in OP 4.12 and detailed in the CRF (including restriction of access to assets, or acquisition of land, including customary fishing grounds) then the CRF will be triggered and appropriate Compensation and Resettlement Plans or Abbreviated Resettlement Plans will need to be prepared. As per OP 4.12, land acquisition will need to take place and be compensated for before any construction on that area begins. However, if the impacts are only temporary (such as temporary restriction on grounds due to the laying of the cable), or outside the scope of OP 4.12, the provisions in the EMP are able to cover the impacts. Thus, any social-related impacts that are not relating to land acquisition as per OP 4.12, including any temporary impacts while the cable is being laid, can be covered by the EMP as detailed in that document. A grievance mechanism for the Project is in place in order to ensure grievances are received, evaluated and resolved in a timely manner. The grievance framework will be in place for both environmental and social grievances.

Environment

The Project will be in compliance with the Environmental Assessment OP4.01, and has been assigned an EA category B. It has triggered Natural Habitats OP4.04, although, according to the EA, no protected areas are crossed by the proposed cable route, and none of the Marine Protected Areas in Tongatapu or Fiji are closer than 4 km and 10 km respectively from the proposed cable route. Also there are no terrestrial protected areas within a 1 km radius of the landing stations in either Tonga or Fiji. Nonetheless, the Project owners have prepared a comprehensive Environmental Assessment (EA) inclusive of the Environmental Management Plan (EMP), based on the Bank-agreed set of detailed terms of reference for this work. The EA has determined the cable's area of influence, presented the relevant biophysical data in the project influence area, catalogued all the Marine Protected Areas and other habitat areas that are within the cable's area of influence to ensure compliance with any of the requirements of these

Marine Protected Areas, determined the likely impacts and their intensity, consulted with all stakeholders, including coastal communities and regional NGOs, and determined and /or established the required institutional framework in Tonga for ensuring full implementation with the EMP and EA recommendations. The preliminary findings of the EA was discussed at an international workshop, in Fiji, with regional international environment NGOs before the EA was finalized and before the route selection, detailed design and technical specifications of the cable laying are finalized.

Significant, non-standard conditions, **if any**, for:

Ref. PAD III.F.

Board Presentation: There are no conditions for Board presentation.

Loan/credit Effectiveness

Additional Effectiveness Conditions

(a) the Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity; and (b) the ADB Cofinancing Agreement and the PRIF Grant Agreement have been executed and delivered by the respective parties thereto and all conditions precedent to their effectiveness or to the right of the Recipient (as applicable) to make withdrawals under them have been fulfilled.

Covenants Applicable to Project Implementation

Disbursement Conditions

No withdrawal shall be made for payments made under Category (1) for Component 1(a) of the Project unless: (i) MIC has issued the TCL License under terms satisfactory to the Association; (ii) The Landing Party Agreement has been entered into by the parties thereto in form and substance satisfactory to the Association; and (iii) TCL submits evidence satisfactory to the Association showing that all necessary authorizations and permits for landing of the submarine cable in Tonga have been obtained in form and substance satisfactory to the Association.

Dated Covenants

The Project Implementing Entity shall: (a) not later than six months after the Effective Date, submit to its Legislature draft legislation or take the applicable regulatory or administrative action, satisfactory to the Association, so as to permit vessels to pass over, but not anchor in, Tongan territorial waters in the route of the cable to be installed under Component 1 (a) of the Project; (b) TCL shall not later than three months after the Effective Date submit evidence satisfactory to the Association showing that it has secured adequate capacity for the Submarine Cable System via the landing station in Suva, Fiji, from the Southern Cross Cable Network or other third-party provider satisfactory to the Association.

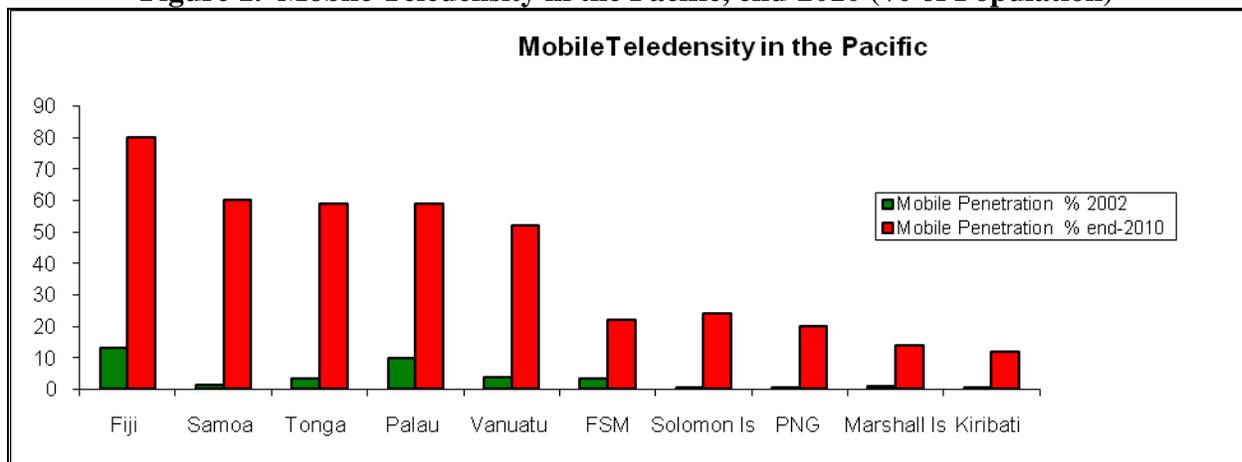
The Recipient shall, through MIC: (a) not later than 12 months after the Effective Date, complete and furnish to the Association for its comments the results of the studies and other activities to be carried out under Component 2 (a) of the Project, including, in particular, the steps to be taken for the harmonization of the TCL License; and (b) not later than 24 months after the Effective Date, complete and furnish to the Association for its comments the results of the studies and other activities to be carried out under Component 2 (b) of the Project.

I. STRATEGIC CONTEXT AND RATIONALE

A. Regional and Sector Issues

- The long-term viability of many Pacific island economies hinges not only on improving domestic growth, but also on the extent to which they can integrate with each other and with neighboring larger economies.** Most Pacific island economies depend on a limited range of external revenues: aid, remittances, natural resource rents and tourism. Pacific economies typically lack economies of scale, face high transaction costs, and have limited institutional capacity; these constraints have been widely documented. Improved connectivity and lower communications costs will contribute both to national economic development and to regional coordination and integration in the Pacific. At the domestic level, improved connectivity lowers transaction costs, creates new economic opportunities, and increases service delivery options.
- Connectivity may thus be considered as a regional public good.** At the regional level, improved connectivity will permit greater efficiency of resource use, and facilitate cooperation on numerous transnational issues, including, for example, management and monitoring of natural resources, disaster mitigation, and collaborative service delivery. Improved, affordable connectivity, both domestic and international, is a cornerstone of the new Framework for Action on ICT for Development in the Pacific (FAIDP), which is a regional strategy endorsed by Ministers and regional agencies that seeks to mobilize information communication technologies (ICT) for development, governance, and sustainable livelihoods.¹
- The anticipated regional benefits of this Program include, for example: improving domestic growth, and enhancing regional integration, through improved connectivity which will engender greater efficiency of resource use and facilitate cooperation on transnational issues as detailed in this section.

Figure 1. Mobile Teledensity in the Pacific, end-2010 (% of Population)



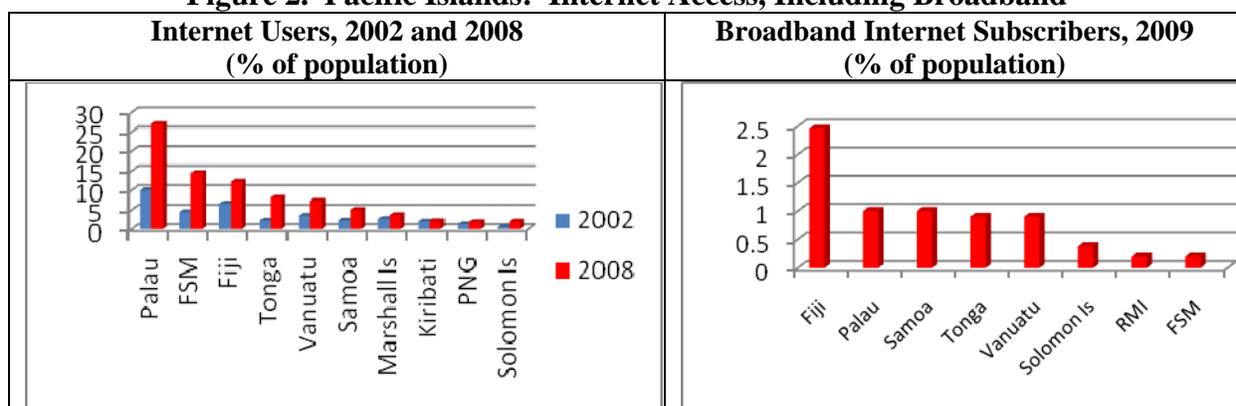
Sources: ITU (2010); data provided by national regulators and telecommunications service providers

¹ See Declaration of the ICT Ministerial Meeting, Tonga, June 18, 2010
[http://www.spc.int/edd/images/stories/ictpapers/Tonga%20Declaration%20\(2\).pdf](http://www.spc.int/edd/images/stories/ictpapers/Tonga%20Declaration%20(2).pdf)

4. Improved, more affordable domestic telecommunications infrastructure is already reducing internal isolation, reducing the cost of doing business, and supporting more diversified economic development and service delivery in the Pacific. Quantitative impacts are being documented.² Many Pacific governments have undertaken or are undertaking telecommunications market liberalization. For example, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu have opened their telecommunications sector to competition, established independent regulators, and have modernized or are modernizing sector legislation and regulations. This has resulted in increased network coverage and access to telecommunications services, and lower costs of entry and usage in those countries. Figure 1 illustrates the dramatic increases in mobile teledensity across the region between 2002 and 2010 as a result of such reforms.

5. **Despite improvements in the policy and regulatory environment at the national level, the high cost and limited capacity of international telecommunications transmission capacity or bandwidth in the Pacific region remains a major bottleneck to better service provision,** particularly to the roll-out of high-speed (broadband) Internet, as well as to new investments in telecommunications and information technology (IT) or IT-enabled services. Many Pacific islands still depend on international satellite links which are relatively expensive and offer limited capacity: satellite bandwidth costs are typically in the range of US\$1,500-3,500/Mb/month, among the highest in the world today. As a result, Internet access, particularly broadband, is generally limited in the region (Figure 2). With the exception of Fiji which has access to the Southern Cross Cable Network (SCCN), and higher-income economies such as Cook Islands, French Polynesia, and New Caledonia, broadband Internet penetration is typically less than one percent of the population in the Pacific region.

Figure 2. Pacific Islands: Internet Access, Including Broadband



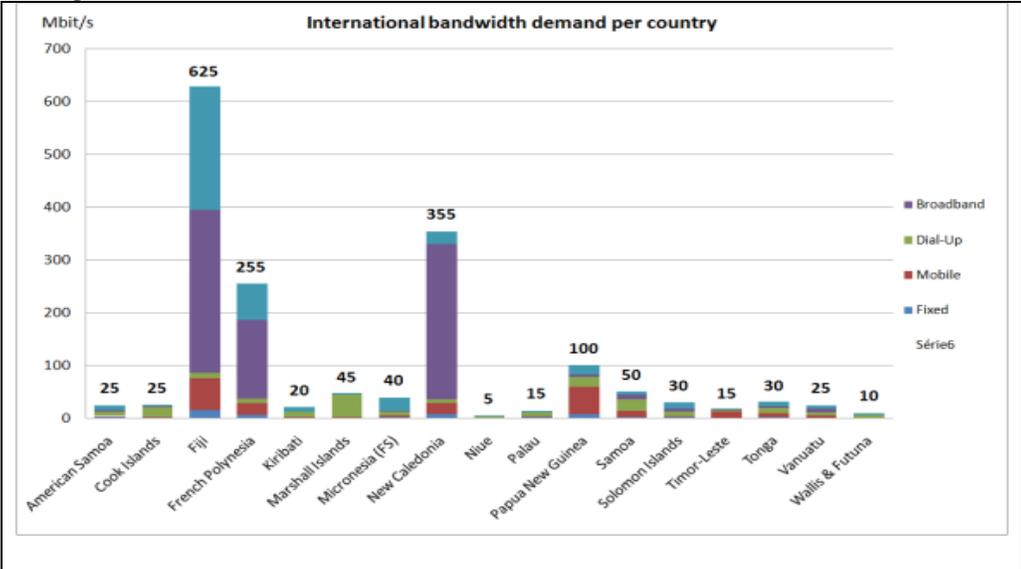
Sources: ITU (2009) national regulators and telecommunications service providers. Figures do not include mobile broadband (3G) which is expected to grow but is still very limited due to bandwidth constraints and higher device costs.

6. **While access to broadband Internet is limited and expensive, demand for the applications that use it is growing rapidly, from government, business and household users.** For example, several Pacific governments are seeking to develop “e-services” ranging from geographical information systems to new modes of distance learning, to online business applications. The telecommunications industry in the region, the business community and governments, as major

² See IFC *Pacific Telecommunications Impact Study*, (forthcoming); TIS: 574887. Pacific Institute of Public Policy (Vanuatu) *Social and Economic Impacts of Introducing Telecommunications throughout Vanuatu* (2009) www.pacificpolicy.org

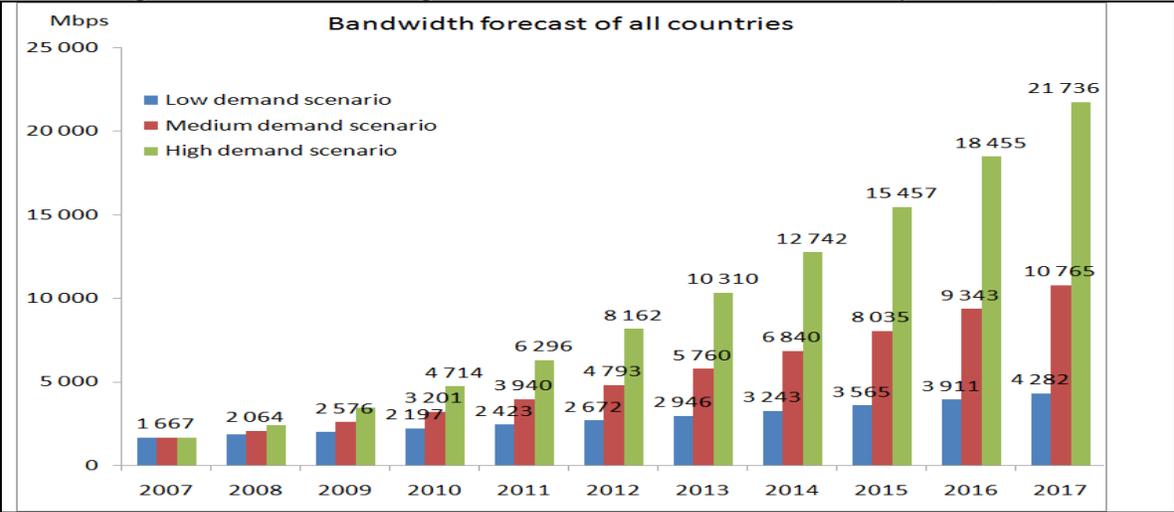
potential users of such infrastructure to deliver services, are therefore keen to explore new options for lower-cost and higher-capacity bandwidth.

Figure 3(a). Pacific Islands: International Bandwidth Demand, 2008



Source: World Bank (2009). Note: Fiji, French Polynesia, New Caledonia, and Papua New Guinea have access to submarine cables. In the North Pacific, the Federated States of Micronesia and Marshall Islands have submarine cable access as of April 2010.

Figure 3(b). Pacific Region: International Bandwidth Projection, 2018



7. At the request of regional stakeholders, the World Bank prepared a detailed report on international connectivity options for Pacific member countries.³ The report was widely

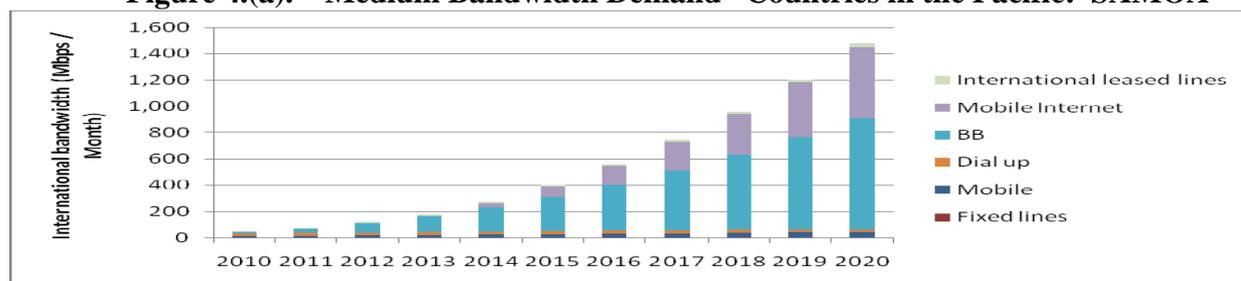
³ World Bank/Polyconseil *Pacific Regional Telecommunications Backbone Network Assessment and Implementation Options Study*, 2009.

disseminated and discussed in the region. The main conclusions are that: (a) there is clear evidence of growing demand for bandwidth across the region (Figure 3); (b) improved connectivity contributes to economic and social development at the national level, and is regarded by stakeholders as a driver of regional cooperation and integration in several sectors; (c) solutions need to be tailored to country needs; submarine cable access is the most cost-effective and efficient means of improving connectivity for Samoa, Solomon Islands, Tonga, and Vanuatu—for the medium-term.

8. The findings of the report were endorsed by the regional ICT community—including representatives of telecommunications policymakers and regulators, the Pacific Islands Telecommunications Association, the Secretariat of the Pacific Community, and the Pacific Islands Forum Secretariat. In its official communiqué, the Pacific ICT Ministerial Meeting in Tonga on February 17 to 20, 2009 directed delegates to work together in the interest of improving regional connectivity. More recently, the Tonga Declaration of June 2010 called on the region’s ICT Ministers, *inter alia* to: “work together to support the advancement of Pacific countries through improved deployment and use of ICTs...,” a message reaffirmed in the April 2011 Meeting of Ministers for Energy, ICT and Transport in Noumea, New Caledonia.⁴

9. **Demand for international bandwidth across the entire region is projected to grow from 1.6 Gbps in 2008 to between 4.5 and 21.5 Gbps by 2018.** The fastest growing demand is in the largest economies, including Fiji, Papua New Guinea, and the French territories; these countries already have connections to international submarine cables (Figure 3). However the “medium bandwidth demand” countries of Samoa, Solomon Islands, Tonga, and Vanuatu are also experiencing rapid demand growth [Figure 4(a) through (d)] and currently rely entirely on limited and expensive international satellite connectivity. As submarine cable connections will likely be more cost-effective for them in the medium-term (Figure 5), these countries have requested the Bank’s—in partnership with other investors’—assistance to finance new submarine cable systems. In response to this request, the Bank has undertaken detailed technical, economic and legal analyses of project options for these countries, financed under the Pacific Region Infrastructure Facility (PRIF).

Figure 4.(a). “Medium Bandwidth Demand” Countries in the Pacific: SAMOA



⁴ [Delegates] “Call for increased coordination amongst all stakeholders in the Pacific at regional, sub-regional and national levels to consolidate efforts to improve connectivity; and “Direct Secretariat of the Pacific Community and Pacific Islands Forum Secretariat to work with relevant regional and international agencies, including funding agencies, to rapidly progress the implementation of regional connectivity solutions that will address the communication needs of the Pacific region. [Official Communiqué, Tonga, February 20, 2009]. Pacific ICT Ministers’ Meeting, Tonga, June 18, 2010 (<http://www.spc.int/edd/en/meeting-home>) and communiqué of the Noumea Inaugural Meeting of Ministers for Energy, ICT and Transport, April 4 to 8, 2011.

Figure 4.(b). “Medium Bandwidth Demand” Countries in the Pacific: SOLOMON ISLANDS

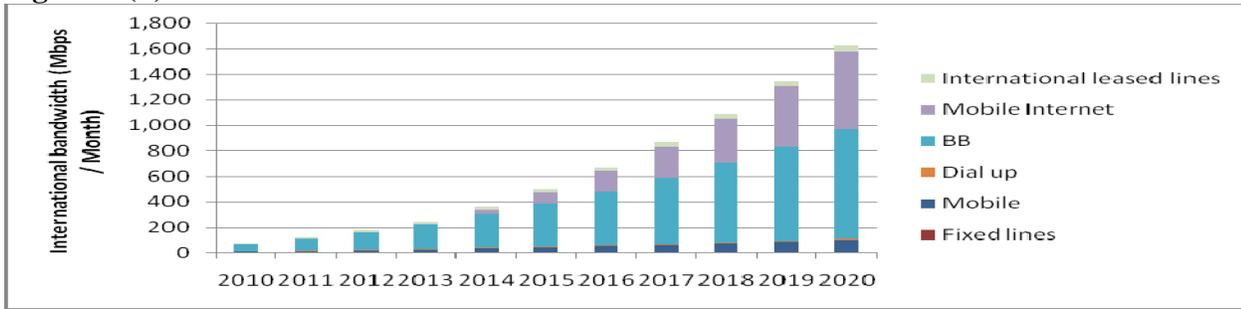


Figure 4.(c). “Medium Bandwidth Demand” Countries in the Pacific: TONGA

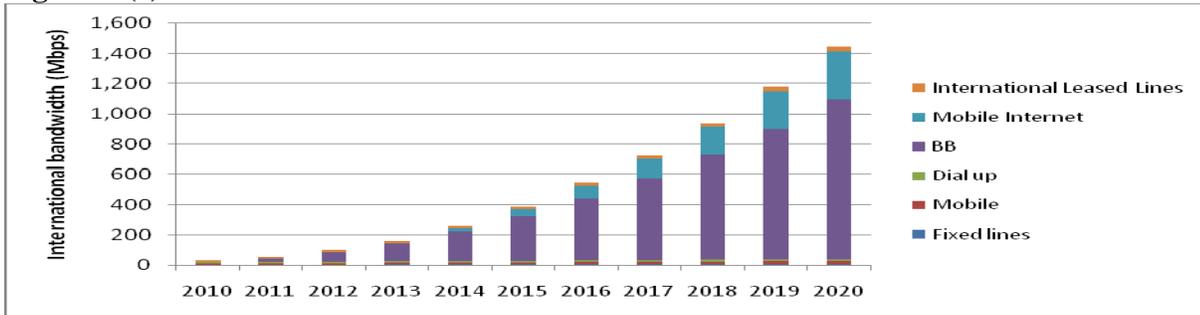


Figure 4.(d). “Medium Bandwidth Demand” Countries in the Pacific: VANUATU

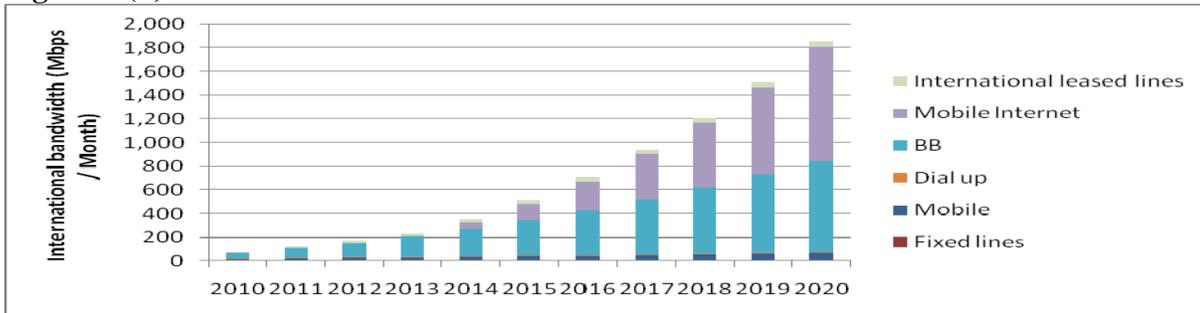


Figure 5. International Connectivity Options, by Demand Category

High bandwidth	Medium bandwidth	Low bandwidth
Fiji, PNG, French Polynesia and New Caledonia	Timor-Leste, Samoa, Solomon Islands, Vanuatu, Tonga, and American Samoa	Cook Islands, Wallis & Futuna, Niue, Kiribati, FSM*, Marshall Islands*, Palau
<ul style="list-style-type: none"> Submarine cable is more cost effective in all demand scenarios 	<ul style="list-style-type: none"> Satellite is still cheaper in the short term A cable infrastructure becomes more effective within 2-5 years with the growing demand 	<ul style="list-style-type: none"> A satellite solution may be more cost effective in all demand scenarios Submarine cable may be feasible in the long-term

Note: scattered populations on outer islands will still need satellite service even with a cable in place
 * FSM and Marshall Islands: cable to main island partly subsidized, April 2010

Source: World Bank/Polyconseil (2009). Note: the United States government has provided support for submarine cable connectivity for the Marshall Islands and Federated States of Micronesia; the French government is considering options for Wallis and Futuna; Cook Islands is considering a partnership with O3B networks, a new-technology satellite service provider.

10. **Addressing the demand for bandwidth by improving connectivity will need to go hand-in-hand with continued development of the enabling environment: the policy, legal and regulatory framework for telecommunications and ICT.** Most Pacific member countries have liberalized their telecommunications markets or are in the process of doing so, to stimulate increased investment in ICT infrastructure and services, including in remote areas. This has entailed formulation of new sector policies, revision of or preparation of new legislation to support competitive, multi-operator markets, and development and adoption of key regulations, for example on numbering, radio spectrum management, interconnection, tariffs, universal service, and competitive behavior. The reforms also entail establishing regulatory institutions with appropriate skills to oversee new market structures. The medium-term regulatory challenges facing Pacific member countries include: open access and fair and transparent wholesale pricing (particularly important for access to infrastructure providing international connectivity),⁵ regulatory response to technological convergence, and developing/maintaining institutional capacity. These challenges will be addressed either through this Program or parallel technical assistance.

11. The World Bank is supporting country-level technical assistance for the enabling environment, in collaboration with other partners. This includes telecommunications/ICT policy and regulatory support for Fiji, Samoa, Solomon Islands, Vanuatu (and more recently Federated States of Micronesia, Kiribati, and the Marshall Islands) for new legislation, regulatory framework and regulatory capacity-building. Partners include Asia-Pacific Telecommunity, Australian Agency for International Development (AusAID), the International Telecommunications Union (ITU), and PRIF. A new **Pacific Regional Regulatory Resource Centre (PRRRC)** for telecommunications and ICT is being established as a collaborative effort among national regulators, policymakers, regional institutions notably Secretariat of the Pacific Community, the University of the South Pacific, the Pacific Islands Forum Secretariat, ITU, PRIF, and the Asian Development Bank (ADB). The PRRRC is being set up

⁵ Some Pacific countries have invested in submarine cables but not liberalized or partially liberalized the access markets resulting in under-used capacity (Federated States of Micronesia, Marshall Islands, and Papua New Guinea).

to assist countries to build and deepen their policy and regulatory capacity and to adopt best practice principles and supporting legislation consistent with international experience, and to maximize the leverage of regulatory resources in the region. The agreed role and functions of the PRRRC will be:

- (a) To collate key industry statistics and issue periodic reports on the state of telecommunications competition in Pacific island countries and the performance of the industry in regard to prices, service quality, and innovation;
- (b) To develop information packages on priority regulatory topics including those where technical skills may be required to analyze industry trends, such as spectrum management, standardization or licensing of new services;
- (c) To provide advisory services on specific telecommunications/ICT issues, in response to country requests and to identify additional sources of expertise, for instance within the international organizations;
- (d) To issue best practice statements on telecommunications policies, laws, implementing rules and regulatory instruments and to conduct case studies;
- (e) To develop a roster of expertise and support quality control of expert advice; and
- (f) To act as a clearinghouse for formal face-to-face or online training programs, and to host such programs on a regional level.

12. The PRRRC is being established as an operating unit within the University of the South Pacific. A Centre Director and technical staff have been recruited, and a governance framework and initial work program developed. Initial funding for the PRRRC has been provided by PRIF; ADB is preparing to commit resources for technical expertise. Funding resources from other partners as well as a membership/user-fee program are also being explored.

B. Rationale for Bank Involvement

13. **The World Bank group has extensive experience in supporting telecommunications and ICT development worldwide, including in small island economies in the Caribbean, and in the Pacific (since 2003).** As noted above, the Bank has been providing technical assistance to Pacific member countries for telecommunications market liberalization and legal and regulatory reform. In addition, the World Bank is working to strengthen regulation of competitive telecommunications markets by supporting the establishment of the PRRRC. The International Finance Corporation (IFC) has made investments of US\$170 million in Pacific telecommunications over the last three years that have helped to catalyze an estimated US\$500 million in private sector investment by new telecommunications operators.

14. **The Bank also has experience in coordinating and financing regional connectivity projects.** For example, the World Bank Group is the major player offering support to regional communications infrastructure development in Africa. In the East and Southern Africa, the World Bank has approved a US\$424 million Regional Communications Infrastructure Program covering about 25 countries. The IFC has contributed US\$32.7 million and mobilized additional investment of more than US\$200 million for the East African Submarine Cable System, or EASSy, a 10,000 km

submarine fiber-optic cable which will run along the East Coast of Africa from Sudan to South Africa. The World Bank Group is also supporting a new multiphase Central Africa Backbone project using the fiber route along the Chad-Cameroon oil pipeline, a West Africa Regional Connectivity program, and a proposed Caribbean Communications Infrastructure program.

C. Higher Level Objectives to Which the Program Contributes

15. **World Bank strategy.** The proposed Program is fully consistent with the objectives of the World Bank's regional engagement strategy in the Pacific, in particular the objective of improving the incentives for private sector-led growth and employment. It also supports the regional strategy's objective of strengthening capabilities for service delivery, by both public and private sectors such as improved public service delivery (including online government services, health and education), increased private sector development opportunities, and reduced transaction costs for businesses and individuals. The proposed Program will also support regional integration objectives of improved service delivery, trade, and communications between Pacific island economies, and contribute to more efficient use of revenues as noted above.

16. **Framework for Action on ICT for Development in the Pacific.** The proposed Program also supports the objectives of the FAIDP which has been prepared collaboratively by multiple development partners in the region, led by the South Pacific Commission. The framework has seven themes and 12 guiding principles. Its goal is to develop and improve ICT services to support development and governance and create new livelihood opportunities for communities in the Pacific. The themes are: (a) ICT leadership, governance, coordination and partnerships; (b) ICT policy, legislation and regulatory frameworks; (c) ICT capacity-building; (d) ICT infrastructure and access; (e) international connectivity; (f) cyber security and ICT applications, and (g) ICT financing, monitoring and evaluation (M&E).

17. **The Project is expected to contribute to many social and economic development objectives.** A project such as this would contribute to increased regional trade in services, and collaboration in health and education service delivery, and in part compensate for limited transport infrastructure between and within island countries. Potential beneficiaries of improved international connectivity in the Pacific are likely to include the following:

- (a) *Small- and medium-sized enterprises:* Lower communications costs reduce overall business transaction costs; communications infrastructure facilitates domestic and cross-border transactions, opens new marketing and distribution channels, improves access to information about markets, prices, and consumers;
- (b) *Primary producers:* Communications infrastructure facilitates access to information on market prices, weather, and agricultural extension services such as electronic trading platforms;
- (c) *Service industries:* Potential for new entrepreneurship, tourism, and establishment of new services such as Internet cafes. Specific opportunities for women entrepreneurs are also anticipated, in this regard. Telecommunications infrastructure also facilitates the extension of mobile phone and/or Internet-enabled financial services which have already started in the Pacific;
- (d) *Government agencies:* Better connectivity enhances their ability to exchange data between national and subnational offices, for example on disease surveillance, planning and budgeting,

and disaster recovery; collaboration between regional organizations and agencies would also be improved;

- (e) *Rural communities*: Travel time and cost savings; potentially easier access to information on health and education services; access to job information; closer contacts—and possibility of transmitting remittances between distant family members located in capital cities or overseas. As in many previously isolated communities around the world, women are expected to benefit from improved access to communications, including for income-generating opportunities, family contacts, and personal safety.

18. The proposed Program will contribute towards realization of the Millennium Development Goals (Targets 1 and 2) by supporting economic growth; and Target 18, by making available the benefits of new technologies, especially information and communications.

II. PROGRAM DESCRIPTION

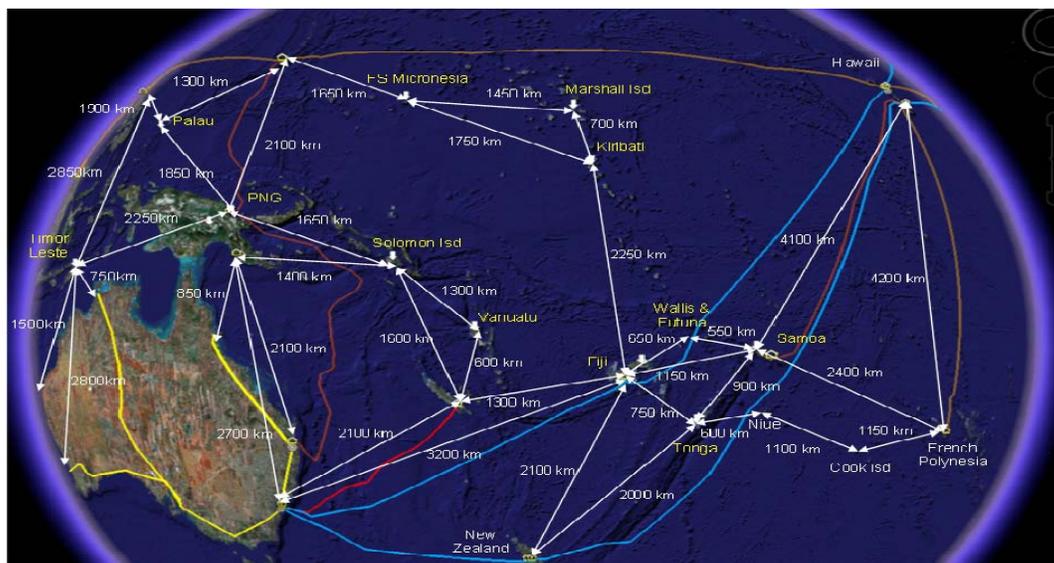
A. Lending Instrument

19. **The proposed lending instrument is a Regional International Development Association (IDA) horizontal Adaptable Program Loan (APL).** A horizontal APL is structured in “horizontal” phases in order to allow participation of different countries as and when they express demand and demonstrate readiness to participate.

20. **Eligibility and triggers.** “Readiness” has been defined as follows: (a) significantly growing bandwidth demand to justify substantial investment in broadband infrastructure; (b) the telecommunications market has been liberalized and multiple telecommunications service providers are operating; (c) following a review of options, a preferred connectivity option has been selected, with endorsement of the government and industry stakeholders; (d) additional sources of financing have been identified, particularly—though not necessarily—from the private sector; and (e) the concerned government is committed to ensuring open access to international communications infrastructure. The triggers for proceeding with a project will include: (a) a written request for support to the World Bank; (b) establishment of a steering committee or equivalent, including a lead counterpart in the public or private sector; (c) preparation of a business plan, including financing and implementation plan.

21. **Rationale for Regional IDA.** As noted above, Pacific island countries are characterized by their small size and extreme geographic isolation. Analysis undertaken for the 2009 World Development Report (“Reshaping Economic Geography”) indicates that the average Pacific island is located 11,500 km from any other randomly selected country, making the Pacific islands the most remote countries in the world (Figure 6). Distance from markets is not simply a geographic reality but results in substantial economic disadvantages for Pacific island countries. Countries that are close to markets have a natural advantage over more remote locations since the exchange of goods, services, labor, capital and ideas is easier and more rapid—a finding borne out by a clear correlation between market access and economic growth.

Figure 6. Distances within the Pacific and Existing Submarine Cable Infrastructure



Source: World Bank/Polyconseil, 2009. Note: the shaded lines indicate existing submarine cables; the white lines geographical distances between Pacific island countries.

22. For many Pacific island economies, overcoming the “tyranny of distance” will hinge on their ability to stimulate domestic growth and on the extent to which they can integrate with each other and with their larger neighbors. Isolation and limited economies of scale also mean that Pacific economies are often heavily reliant on aid, remittances, natural resource rents and tourism. In this context, improving connectivity throughout the region has the potential to support national economic growth and to underpin the critical processes of regional coordination and integration. Greater and more affordable connectivity in the Pacific would help lower transaction costs, create new economic opportunities and enhance communication and delivery of services to currently isolated domestic communities. From a regional perspective, improved connectivity has the potential to enhance the efficiency of resource use, to facilitate cooperation on a wide range of transnational issues including management and monitoring of natural resources (e.g., fisheries), comprehensive mitigation efforts addressing natural disasters and climate change and adaptation, as well as collaborative service delivery.

23. The Pacific Regional Connectivity Program draws on the Bank’s sector experience in the region and globally. The first phase of the Pacific Regional Connectivity Program supports the construction of a submarine fiber-optic cable between Fiji and Tonga, thereby connecting Tonga to the global telecommunications network. The Governments of three other neighboring Pacific countries – Samoa, the Solomon Islands, and Vanuatu—have made requests for IDA support of similar connections. These will be sequenced under this program according to client readiness. The Program thus responds directly to the eligibility criteria for IDA regional funding, and, as such, is expected to qualify for additional resources from the IDA Regional Program. In addition to individual country commitment, there is demonstrable interest around the Pacific region to increasing regional connectivity (as evidenced by the broad endorsement through FAIDP, whose objectives this program will support).

24. IDA allocations will follow country considerations. Since this is a regional program, supplementary regional IDA funding can be used to leverage country allocations for up to two-thirds of the full proposed IDA amount of each Project. In the case of small countries, the regional IDA allocation will be significantly larger; their national IDA contribution will be capped at 20 percent of their national IDA envelope.

B. Program Objective, Approaches, and Phases

25. **The objective of the Pacific Regional Connectivity Program is to reduce the cost and increase the availability of international bandwidth for participating countries**, and thereby facilitate the development of a wide range of ICT applications to support social and economic development in the Pacific region. This objective will be achieved through catalytic public investments in telecommunications infrastructure (submarine cable systems), in partnership with the private sector and other development partners, and through technical assistance for the telecommunications legal/regulatory environment. Specifically, the Program aims to connect Samoa, Solomon Islands, Tonga, and Vanuatu by submarine fiber optic cables to the global communications networks. This may be via Australia, Fiji, New Caledonia, and the United States and would ultimately create a Pacific regional communications network. Smaller island economies in the North Pacific (e.g., Federated States of Micronesia, Kiribati, and Palau) may also be connected in the outer years, by cable or satellite. Expected outcomes in all the participating countries are:

- Increased infrastructure capacity.
- Increased access to ICT infrastructure and services using two proxies:
 - Access to Internet services (per 100 people)
 - Access to telephone services, mobile (per 100 people)
- Reduced price of international communications.

26. **Approaches.** The Program as a whole is expected to include a combination of private and public funding. Worldwide, investment in telecommunications infrastructure is typically led by the private sector. Public funding has tended to be catalytic, for example channeled through fiscal stimulus programs or universal service schemes, or other forms of subsidy. The World Bank has examined numerous options and financing models for backbone infrastructure and indicated that public financing/subsidy may be appropriate in cases of market failure or to catalyze other funding sources (World Bank *Extending Reach and Increasing Access: ICT for Development Report, 2009*).

27. The Phase 1 Tonga-Fiji Connectivity Project will be financed entirely through the public sector, and implemented by a public entity. This is due to the prevalent market conditions and investor interest. The Bank will encourage private participation in future phases of the Program to the extent feasible, and has examined several possible financing and governance models, to be applied as appropriate to the particular country circumstances. Such models could include, for example:

- (a) IFC equity investment in, or loan to Project led by private sector; IDA support for enabling environment;

- (b) IFC investment/loan to private investor or consortium, or “special purpose vehicle,” plus IDA credit to Government, to be on-lent to private investor or consortium, or used for equity participation
- (c) IDA credit or grant to Government for: investment (onlending), equity participation, prepurchase of capacity, or channelled through universal service scheme administered by the regulatory authority.

28. **Phases.** The Program will be implemented in phases over a 5- to 10-year period, based on projected country demand, country readiness and the participation of other stakeholders in the private and public sectors. The indicative phases (subject to client readiness factors, as noted above) are as follows, but any phase could be advanced based on demand:

- (a) Phase 1: Tonga-Fiji Connectivity Project (FY12)
- (b) Phase 2: Solomon Islands Connectivity Project (FY13)
- (c) Phase 3: Samoa Connectivity Project (FY13/14)
- (d) Phase 4: Vanuatu Connectivity Project (FY13/14)
- (e) Phase 5: Northern Pacific Connectivity Project (Currently there is an initial expression of interest from Palau and Yap state in the Federated States of Micronesia) (FY14/15)

29. **Country demand.** Samoa, Solomon Islands, Tonga, and Vanuatu have previously requested IDA support to assess cable options. Tonga meets all the readiness criteria outlined above and the Government is keen to expedite the project, hence its inclusion in Phase 1. Fiji is not expected to participate at the government level except to ensure open access to the SCCN (already provided for by the Commerce Commission’s determination, effective July 1, 2010) and to facilitate environmental permits and authorizations.

30. **The total estimated cost of the Pacific Regional Connectivity Program is US\$186.5 million.** The final amount for Phases 2, 3, 4, and 5 depends on the choice of submarine cable route with different implications for capital investment, operational and backhaul costs. The Program will be financed by a combination of telecommunications industry investments and catalytic/complementary public financing, including contributions from development partners (e.g., ADB, European Investment Bank, IDA, IFC, PRIF, bilateral development agencies). **The estimated IDA contribution would be up to US\$88.2 million,** including country and regional IDA allocations. These amounts are subject to government borrowing decisions, availability of private capital, and funds from other partners, including IFC.

Table 1. Indicative Program Phasing and Estimated Total Costs⁶

Program Phases and Indicative Costs (US\$m)	Proposed Components (US\$m)	Project Scope & Status
Phase 1. Tonga-Fiji Connectivity Project US\$34 million (IDA: US\$17.2m grant)	<i>Submarine Cable System: US\$32.6 m</i> <i>Enabling Environment: US\$1.0 m</i> <i>Project management: US\$0.4 m</i>	<ul style="list-style-type: none"> ▪ Submarine cable linking Tonga to the Southern Cross Cable in Fiji to be cofinanced by IDA, ADB and Tonga Cable Ltd. ▪ Technical and economic analysis completed ▪ Legal and regulatory analysis completed ▪ Environmental Impact Assessment and Monitoring Program completed March 2011. ▪ Draft bidding documents prepared. ▪ Negotiations concluded June 2011
Phase 2. Solomon Islands Connectivity Project US\$50 million (IDA: US\$20m credit)	<i>Submarine cable system & infeasible right of use (IRU): US\$49.5m</i> <i>Project Management and Administration: US\$0.5m</i>	<ul style="list-style-type: none"> ▪ Submarine cable link to closest network ▪ Cable options assessment and technical and economic analysis completed May 2010; to be updated to consider different design and access options ▪ Legal assessment completed October 2010 ▪ Informal working group established; Project Steering Committee to be established ▪ Enabling environment already supported by ongoing Solomon Islands Telecoms & ICT TA project (IDA + PRIF) ▪ IDA support contingent on Government decision to borrow
Phase 3. Samoa Connectivity Project US\$43.5 million (IDA: US\$20.5m credit)	<i>Submarine Cable System: US\$42 m</i> <i>Enabling Environment: US\$1.0 m</i> <i>Project Management and Administration: US\$0.5m</i>	<ul style="list-style-type: none"> ▪ Submarine cable linking Samoa to closest network ▪ Initial options assessment, technical economic and financial analysis completed May 2010 ▪ Legal assessment undertaken September 2010 ▪ Project Steering Committee established; decision on cable route, options, possible financing structures pending.
Phase 4. Vanuatu Connectivity Project US\$39 million (IDA US\$20.5m credit)	<i>Submarine Cable System: US\$38.5m</i> <i>Project Management and Administration: US\$0.5 m</i>	<ul style="list-style-type: none"> ▪ Submarine cable linking Vanuatu to Fiji. ▪ Initial options assessment and technical and economic analysis completed May 2010 ▪ Legal assessment undertaken September 2010 ▪ Private investor has taken lead in project development; seeking funds from various sources; the extent of Government participation, and possible IDA involvement, is not yet established ▪ Enabling environment supported by ongoing Telecoms/ICT TA project (AusAID Grant through PRIF).
Phase 5. Northern Pacific Connectivity Project US\$20 million (US\$10 million IDA)	<i>Backbone Infrastructure</i> <i>Enabling Environment</i>	<ul style="list-style-type: none"> ▪ Initial expressions of interest from Palau and Yap state in Federated States of Micronesia ▪ Details of phase to be identified ▪ Could include financing for cable or shared

⁶ Note: The total cost of each phase depends on a number of factors including cable routing, backhaul costs etc.

Program Phases and Indicative Costs (US\$m)	Proposed Components (US\$m)	Project Scope & Status
		satellite facilities and regulatory TA
TOTAL	US\$186.5 million	
Proposed IDA + Regional IDA Contribution	US\$88.2 million	

C. Program and Project Components

31. **The proposed Program components are as follows** for each participating country. The size and scope for Phases 2 through 5 will differ according to country-specific requirements at the time of Project appraisal. Table 1 indicates the likely scope, based on country needs.

- (a) *Component 1. Broadband Infrastructure Investment.* For Samoa, Solomon Islands, Tonga, and Vanuatu, and possibly Phase 5 participants, this will likely include the costs of marine survey, plant and equipment, terminal station and equipment (landing station), cable deployment and maintenance for an agreed contractual period, and contingency. For smaller countries with lower projected bandwidth demand, this could include financing for shared satellite facilities.
- (b) *Component 2. Enabling Environment Technical Assistance:* Will include advisory assistance regarding the legal and regulatory enabling environment and capacity building on telecommunications/ICT policy and regulatory issues, including advice on government ICT applications as required. For the program phases noted above, this would focus on Tonga and Samoa (and possibly smaller countries in the outer years). Solomon Islands and Vanuatu are already receiving technical assistance on telecommunications regulation through ongoing operations; and
- (c) *Component 3. Project Management Support to the Relevant Implementing Entity.* Will include technical assistance for project coordination, procurement, financial management, and audit.

32. **Phase 1 of the Program will support the construction of a submarine cable connection from Tonga to Fiji**, addressing Tonga’s medium-term bandwidth requirements, and facilitating communications, trade and services between Tonga and Fiji (Figure 7). The expected benefits to Tonga include: new opportunities for economic diversification particularly in the services sector; improved access to Government services and mobilization of ICT for education. The Project will be implemented primarily by a corporation, Tonga Cable Ltd (TCL).

33. The Phase 1 Project scope is as follows. Financing arrangements are summarized in Table 2. Details are provided in the Technical Annex (Phase 1 Tonga-Fiji Connectivity Project).

Component 1. Submarine Cable System (US\$32.6 million) will finance the construction of an 827 km repeatered cable linking Nuku’alofa (Tonga) with Suva (Fiji) plus a landing station in Tonga. The cost includes cable materials, marine survey and laying costs, and cable equipment. In Fiji, the cable will be connected to the existing SCCN landing station in Suva. The SCCN connects Fiji with Australia (Sydney) and the United States (Hawaii).

Component 2. Enabling Environment, (\$1.0 million) will finance technical assistance for the Ministry of Information and Communications on (a) telecommunications policy, legal and regulatory development, and on the legal and regulatory environment for Internet and e-transactions, and (b) regulatory capacity building.

Component 3. Project Management and Administration (\$0.4 million) will provide administrative support to TCL and to the Ministry of Information and Communications in the areas of project management, procurement, financial management, communications strategy and audit.

Figure 7. Tonga-Fiji: Proposed Submarine Cable Route



Table 2. Phase 1: Proposed Components and Indicative Financing (US\$m)

Component	Cost (US\$m)	Financing
Component 1. Submarine Cable System (International Connectivity)	32.6	ADB grant: US\$9.7 IDA grant: US\$16.5 TCL: US\$6.4
Component 2. Enabling Environment	1.0	IDA grant: US\$0.5 PRIF grant: US\$0.5
Component 3. Project Management and Administration	0.4	IDA grant: US\$0.2 TCL: US\$0.2
Total	34.0	

D. Lessons Learned and Reflected in the Program Design

34. The proposed Program takes into account the lessons of experience from implementation of telecommunications sector reform/development projects, from other regional connectivity projects, and also from operations in the Pacific region more broadly. These lessons are reflected in the design of

the proposed Projects, risk analysis and management, and selection of country readiness/eligibility criteria.

- A constructive and open relationship between the public and private sectors is very important for successful development of telecommunications sectors at the national level as well as at the regional level. For this reason, establishment of a public-private steering or project committee is a proposed requirement for individual projects.
- The legal and regulatory environment in participating countries needs to support open access to international communications infrastructure, and wholesale pricing needs to be fair and transparent; the regulatory institution needs to be empowered to protect the interests of consumers. Both Fiji and Papua New Guinea have had access to submarine cables for many years, but until recent liberalization of international gateways, and even more recent regulations on wholesale pricing, these resources have been “captured” by monopolies and the benefits have not accrued to consumers. Related to the above, capacity-building will be required to support regulatory institutions to ensure that the benefits from new investments are maximized.
- Projects will need to anticipate possible changes in technology that might alter the business case for investment in a particular type of communications infrastructure.
- Collaboration between development partners needs to be extensive, given the limited capacity of counterparts; to the extent possible procurement and financial management procedures need to be aligned, if not harmonized, to minimize the administrative burdens of the projects.
- Regional connectivity projects can be complex, particularly if their scope includes both ICT infrastructure and ICT applications. As the institutional environment in the Pacific remains challenging, the proposed scope of the regional connectivity projects will focus primarily on infrastructure. The number of contracts to be procured under individual projects will also be minimized.

E. Alternatives Considered and Reasons for Rejection

35. **Technical assistance support only, with all infrastructure investment privately funded.** The Program acknowledges that the private sector is the primary source of investment in telecommunications infrastructure worldwide, including in the Pacific. However, the required investments for regional communications infrastructure, as well as the broader development benefits, are significant. For this reason, numerous governments—including Organization for Economic Cooperation and Development (OECD) countries—have been investing in communications backbone networks directly, or in partnership with the private sector in recent years. A role for public funding—including development partners—is therefore justified in this region. The role of IDA funding is expected to be catalytic, and strengthen the business cases for individual projects.

36. **Including support for ICT applications.** This alternative was considered, particularly as other regional connectivity projects have included or are including support for ICT applications as part of a “menu” of options for participating countries. This would add considerable complexity to the Pacific program, in a weak institutional environment, and would risk dilution of priorities. The

Program is therefore designed to build the infrastructure foundation for future applications development, in partnership with other institutions.

37. **Including domestic backbone networks.** In the interest of simplifying project design and administration, investment in domestic backbone is not anticipated at this stage. First, the expected savings from international connectivity are expected to create incentives for the telecommunications industry to undertake such investments. Second, IDA is separately assisting several Pacific member countries with the development of universal access/service programs. Such programs could eventually be used to partially-finance domestic backbone where there are remaining access gaps.

38. **Alternative lending instrument (individual country projects). An APL appears to be a more appropriate instrument to be used for large-scale infrastructure deployment in the Regional context.** Regional cooperation is necessary when considering increasing connectivity in the region as countries will need to come to an agreement on the use of the country's landing stations. Further increased connectivity benefits the countries involved as it will increase capacity/bandwidth which in turn could trigger further demand for high-bandwidth activities (i.e., downloading files and media services). Therefore, an APL rather than individual specific investment credits/grants for Pacific member countries has been selected as the instrument. The APL approach allows the Program to add on country projects to a program that has a common project objective and through which lessons can be learned from at each phase.

III. IMPLEMENTATION

A. Partnership Arrangements

39. Development of the proposed Program, including the upfront analytical work, has benefited considerably from collaboration and partnership between the telecommunications industry, as represented by the Pacific Islands Telecommunications Association, the South Pacific Commission, the Pacific Islands Forum Secretariat, the Asia Pacific Telecommunity, and the ITU and financial institutions such as the ADB and the World Bank.

40. At the Project level, the partnership arrangements for Phase 1 have been noted above: joint financing between the ADB and the World Bank, and grant funding from PRIF. For subsequent phases, potential partnerships are envisaged with ADB, PRIF, and possibly with the IFC, the European Investment Bank and other multilateral and bilateral partners (such as Australia, France, New Zealand). Such partnerships will likely take the form of joint or parallel financing, including, wherever feasible, joint financing of infrastructure. Harmonization of procedures will be important to minimize the administrative burdens on counterparts. Environmental/social and fiduciary assessments would be carried out jointly. As the telecommunications market in the region matures, private participation in future projects is also anticipated; this may also entail project-level partnership with IFC.

B. Institutional and Implementation Arrangements

41. **Regional level.** At the regional level the Program will support the FAIDP which will be reviewed by the region's ICT ministers and other participating agencies in annual meetings. Progress

under the Program will therefore be reported by the relevant ICT ministry/regulatory or implementing entity of the participating country to the annual Forum Economic Ministers' meeting and annual Pacific Leaders' meetings, and also shared with regular meetings of industry associations, the Pacific Islands Telecommunications Association and the Pacific Telecommunications Council. The Secretariat for the Pacific Community is taking on an overall advisory/coordination role for ICT development in the region, with support from the ITU.

42. **National implementation.** Arrangements for Tonga are described in the Technical Annex for Phase 1. For each other individual Project, implementation arrangements will be designed for each country, where it is expected that the sector ministry will be responsible for the overall coordination, implementation and supervision of the Project. The ministry will establish a Project Management Unit (PMU) for that purpose. In cases where memoranda of understanding for other projects can be leveraged, consideration would be given to sharing PMUs to minimize implementation costs. At the national level, Projects will be overseen by a steering committee with responsibility for reviewing project scope and implementation progress. Steering committees would comprise public (governmental and regulatory authorities) and private sector and civil society representatives, as appropriate. In any case, the national implementation arrangements will consist of appropriate project coordination, procurement and financial management and accounting specialists.

C. Monitoring and Evaluation of Outcomes/Results

43. **Program.** Annex 3 summarizes the proposed M&E framework for the Program. The framework is a template, an overarching guide that will inform and be tailored to individual circumstances for each participating country. Annex 4 summarizes the broad M&E arrangements at the Project level. At the Program level, progress in implementation and outcomes relative to the overall FAIDP will be reported to regional institutions, primarily through the Pacific ICT Ministerial Forum and, where appropriate, the Pacific Leaders' forum, as well as to the Pacific Islands Telecommunications Association. It will also be tracked by the PRRRC.

44. **Project.** Primary responsibility for M&E rests with the Project implementing entity which will be responsible for collecting, analyzing and disseminating data to stakeholders. Each Project will track defined inputs, outputs and outcomes. Sector results will be documented in the annual report of the national regulatory authority or institution responsible for data collection.

D. Sustainability

45. **Enabling environment.** Technical assistance will be provided under individual Projects, or complementary operations, as in the case of Solomon Islands and Vanuatu, to support the legal and regulatory environment and help build the capacity of sector ministries and regulators. The sustainability of this support is further complemented by the proposed PRRRC.

46. **Infrastructure investments.** From a technical perspective, submarine cable systems are designed with a 20-to 25-year lifespan. Once the infrastructure is in place, operational costs are relatively low. With regard to the business model, the premise for provision of public funding under the program is that the projects are financially sustainable over the medium-term, yielding a positive

internal rate of return. This will be discussed in the economic analysis for each project phase. The program also offers open access networks to all prospective users to maximize potential revenues.

E. Critical Risks and Possible Controversial Aspects

47. **Program risks.** Table 3 summarizes the main program risks. Project-specific risks are discussed in the respective technical annexes.

Table 3. Critical Risks and Mitigation

Risk	Risk Rating	Risk Minimization Measures
Security and political instability in participating countries	S	High-level political endorsement for proposed projects through regional institutions. Communications and awareness campaigns.
Natural disaster damages submarine cables	S	Communications redundancy and back-up built into network planning.
Economic volatility in participating countries	S	Macroeconomic policy dialogue and risk mitigation measures at the country level
Legal/regulatory risks, in particular pertaining to open access issues, and possible anti-competitive behavior	M	Commitment [regulation] to open access in place prior to appraisal for each phase of the program
Technological changes render proposed solutions obsolete	M	Technical review of connectivity options prior to appraisal for each phase of the program
Implementation delays caused by insufficient consensus about ownership structure, business model, and inadequate implementation	S	Upfront agreement on governance and institutional arrangements for each program phase, including financial contributions from each party.
Limited experience and capacity of implementing entities	S	Project or steering committees to be established for project and sector monitoring.
Lack of procurement experience and staff	H	Appointment of a procurement staff and procurement consultant. More frequent supervision. Limited number of contracts.
Lack of financial management experience and staff	H	Appointment of a financial management staff and financial management consultant upfront. More frequent supervision.
Sustainability of institutional development	M	Technical assistance focusing on knowledge transfer. Coordination with other IDA-financed programs in the sector and with partner institutions.
Limited experience of environmental management	M	Strengthen environmental monitoring and management capacity of project implementing entity
Overall risk rating	S	

F. Credit/Grant Conditions and Covenants

48. Since the Program objective is to support increased access to and reduced cost of international bandwidth, key conditions for the Program are that regulations on open access and wholesale pricing have been developed by the participating countries.

49. Effectiveness/Disbursement conditions at the Project level, as applicable, shall include the following: (a) project steering committee has been established; (b) a PMU has been established within

the implementing entity; (c) draft bidding documents for infrastructure (e.g., submarine cable systems) have been prepared; (d) relevant permits and license have been issued; and (e) financial management arrangements are in place.

IV. APPRAISAL SUMMARY

50. For Phases 1 through 5, the relevant Technical Annex will cover Project-specific economic, financial, technical, fiduciary, and safeguards issues. This section discusses broader program issues.

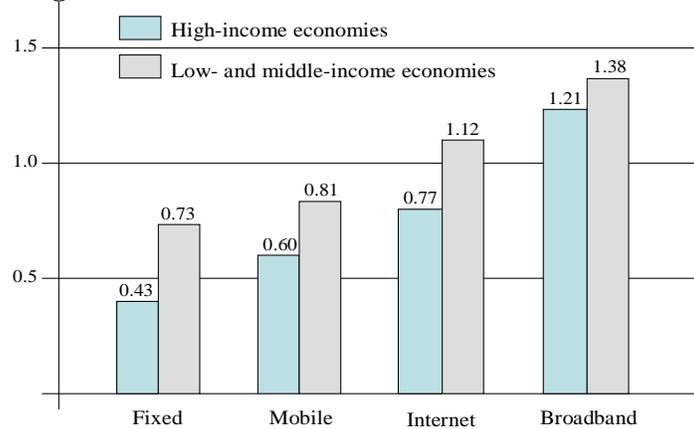
A. Economic and Financial Analysis

51. **At the Program level, improving connectivity is expected to have broader implications for economic and social development in the Pacific region.** Broadband Internet has become essential to the functioning of modern economies all over the world, and the Pacific will be no exception. A recent World Bank study includes Internet and broadband, in addition to the fixed and mobile phones, in an econometric analysis of growth in 120 countries between 1980 and 2006. Results show that for every 10 percentage-point increase in penetrations of broadband services, there is an increase in economic growth of 1.3 percentage points (Qiang 2009).

52. This growth effect of broadband is significant and stronger in developing countries than in developed ones, and higher than that of telephony and the Internet (Figure 8). The impact is expected to be even more robust once the penetration reaches a critical mass. As most developing countries are at an early stage of broadband development, they are likely to gain the most from investing in these networks to reach the critical mass for higher impact and before the diminishing returns take effect.

53. For Pacific economies future growth prospects will depend to a significant extent on how well they can be integrated into the broader regional, if not the global, economy. ICT, particularly high-speed Internet, is playing an increasingly central role in this—enhancing trade, facilitating cross-border payments, increasing productivity and improving the quality of public service delivery—all key components of economic growth and poverty reduction. In many developing countries, businesses, governments, teachers, doctors, farmers, and fishermen, are using ICTs to communicate, share information, improve productivity and service delivery, find better prices, improve access to markets, and increase their bargaining power. As increased access to mobile telephony is beginning to demonstrate, these trends are also highly likely in the Pacific. The proposed Program is therefore expected to benefit the entire population including universities, schools, hospitals, banks, businesses, and government ministries and departments.

Figure 8. Growth Effects of Telecommunications



Note: The y axis represents the percentage-point increase in economic growth per 10-percentage-point increase in telecommunications penetration. All results are statistically significant at the 1 percent level except for that of broadband in developing countries, which is at the 10 percent level. *Source:* World Bank, *Extending Reach and Increasing Impact. Information & Communications Technology for Development, 2009.*

54. As a cross-cutting enabler of service delivery, impacts of ICT have been well documented in particular in improving the quality, efficiency, and reach of basic services such as health, education, and other essential services, particularly to underserved and poorer communities. Availability of affordable telecommunications infrastructure is a key requirement to develop and roll-out applications that benefit the poor and disenfranchised. For example in Kenya, a third of the population now has access to basic banking services using mobile phones—while less than five percent of the population previously had a bank account. As the cost of telecommunication services goes down in the Pacific similar applications are likely to also surface. In addition, with the opportunity to obtain needed bandwidth to stimulate development of innovative applications for use in government institutions, the project will assist in improving governance and transparency of government functions.

55. High-speed Internet has been shown to boost the productivity of firms as well as generate employment opportunities. New growth theory suggests that long-run economic growth emanates from spillover arising from innovation and investment in new technologies. Broadband Internet access can be considered an important new technology, and broadband is increasingly recognized to promote productivity and boost aggregate economic growth (OECD, 2003). Analytical studies have shown that firms using standard broadband (defined as connection speeds above 256 Kbps (OECD, 2002) were on average 10 percent more productive than firms using dial-up Internet access. Faster Internet speeds are also causally related to increased employment opportunities with analysis showing that for every one percentage point increase in broadband penetration within a region, employment increases by 0.2 to 0.3 percent per year for the private, nonfarm economy (Crandall et al, 2007). Indeed, studies show a clear positive relationship between employment and broadband penetration in the manufacturing and service industries, with business growth shown to be particularly significant for larger businesses and for IT intensive sector (Lehr *et al.*, 2006). The results of these studies support the hypothesis that broadband penetration enhances economic activity. Increased broadband speeds and less expensive data access have the potential to promote economic activities in the Pacific region supporting the

growth and productivity of businesses and gradual transfer of employment from agricultural to service industries and expansion of the region's developing ICT sector.

56. In the case of the Phase 1: Tonga-Fiji Connectivity Project a cost savings analysis was conducted (Annex 9 in the Technical Annex) to approximate the relative cost savings/benefits produced by fiber compared to satellite. Assuming a low growth scenario of bandwidth demand, and comparing current satellite prices of US\$3,600 per month per Mbps per second at a decreasing price reduction of 1 percent per year, to TCL proposed prices, the net present value was calculated. The net present value was found to be in the range of US\$20 to US\$30 million (depending on the discount rate of 25 percent or 20 percent, respectively), indicating a significant cost savings (i.e., benefit) and a positive gain in consumer welfare.

B. Technical

57. The Projects will likely finance international submarine fiber-optic cables. The type of cable and routing will be selected based on country-specific conditions. In some cases, financing for other types of connectivity (satellite) may be provided. Full technical reviews will be undertaken in each case.

C. Fiduciary

58. Fiduciary assessments have been carried out for Phase 1 (Technical Annex). **Procurement** for each Project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, updated May 2006 and May 2010 and the provisions stipulated in the Financing Agreements. For each contract to be financed under individual Projects, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the Bank project team in the procurement plan. The procurement plans will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The procurement risk ranges from substantial to high reflecting limited capacity and experience of implementing entities; procurement specialists will be engaged under the Project to support the implementing entities, and bidding documents for submarine cable systems were drafted at Appraisal. The number of contracts will be limited, and the majority will be subject to prior review by the Bank, including technical review. In some cases, submarine cable system contracts may be financed by more than one institution (e.g., ADB, and IDA in the case of Phase 1). In such cases, the Bank will work with partner institutions to agree on the use of the Bank's standard bidding documents.

59. The overall **financial management** risk for the Program varies from moderate to substantial, also reflected limited institutional capacity and experience. A detailed risk assessment and mitigation plan will be developed for each Project, and action plan to strengthen financial management agreed. Implementing entities will recruit suitably-qualified financial management specialists prior to effectiveness. Implementing entities will agree on the format of unaudited interim financial reports to be used for the projects, adopt financial management manuals, use appropriate financial management software, and agree with the Office of the Auditor-General (or equivalent) on terms of reference for external auditors. Financial management supervision will be carried out by the Bank at least three

times in the first year. The initial supervision, before the first disbursement of funds, will include a review of progress in implementing the above-mentioned action plan.

D. Social

60. **The Program is expected to have many positive social impacts by improving access to communications.** Appropriate safeguard documentation will be prepared for each phase. Land acquisition and livelihood impacts will be assessed on a project-specific basis, and mitigation plans prepared accordingly. Where involuntary land acquisition and/or resettlement are confirmed and specific project areas are known prior to appraisal resettlement plans (RPs) will be prepared. Where involuntary land acquisition and /or resettlement is not confirmed or specific project areas are unknown prior to appraisal then a resettlement policy framework will be prepared. Each project will need to assess whether there are indigenous people located in the project area. If indigenous people are found to be in the project area, an Indigenous People's Plan must be prepared by the client as per World Bank operational policy OP 4.10. If indigenous people are potentially found in the project area, but it will be unclear until detailed design, an Indigenous People's Framework must be prepared. Should the OP 4.10 be triggered, then free, prior and informed consultations that can lead to broad community support for the project will need to be organized.

E. Environment

61. The program will mostly finance submarine fiber-optic cables between land based landing stations on coastal areas as described earlier. The exact cable routes will be determined by a marine survey that will also map out the locations of all the sensitive ecosystems and the laying of the cables will be done by a specialized ship guided by sonar and other systems. The final cable routes will be chosen to avoid sensitive ecosystems such as hydrothermal vents and seamounts given that the geophysical conditions at these locations will also destroy the cable. The use of sonar may be a nuisance to cetacean communities but this risk will be mitigated by adoption of industry best practice protocols. Given these considerations, the program is unlikely to significantly impact the marine environment and sensitive ecosystems and species during the laying of the cable (i.e., the construction phase). Therefore, any impacts that occur are likely to be short-term, and will not lead to induced and/or cumulative impacts.

61. The program does trigger EA OP4.01 and, due to the nature of the impacts described above, the program has been assigned EA category "B." Given the presence of sensitive ecosystems in the marine environment within the vicinity of these Pacific island countries, the program is also triggering Natural Habitats OP4.04. Therefore, each project (i.e., APL Phase) in the program will prepare a separate stand alone comprehensive Environmental Impact Assessment (EIA) and corresponding Environmental Management Plan (EMP) in compliance with OP4.01 and national requirements. The issues raised by the Natural Habitats OP4.04 will also be addressed in the EIA and EMP. The EIA and EMP will be subject to meaningful consultations with all stakeholders including potentially affected communities and relevant scientific nongovernmental organizations at the time they are being prepared to ensure full capture of the issues.

62. The World Bank will review and clear the project level EIA and EMP and ensure disclosure of these documents both locally and at the InfoShop as a condition of appraisal of the project (i.e., the

APL Phase). To ensure these arrangements are fully documented, at the program level an Environmental and Social Management Framework (ESMF) which is attached in Annex 5 of this Program Appraisal Document has been prepared explaining the processes for preparing, consulting on, approving and disclosing project level EIA and EMPs. The ESMF includes best practice protocols for use of sonar in marine areas where cetacean communities may be present and also provides detailed sample terms of reference for preparing the project level EIA and EMP. The program level ESMF was disclosed in the World Bank’s InfoShop on March 24, 2011.

F. Safeguard Policies

63. **The physical components of this Program will mostly be limited to the deployment of submarine cables and of the landing stations where required.** The risks associated with the kind of infrastructure financed under this Program are generally low to moderate for the reasons noted above, and a summary of the triggered policies is noted below. Land acquisition for terrestrial facilities, or impacts to people’s livelihoods, may trigger OP 4.12 Involuntary Resettlement, but will be evaluated on a case by case basis. If indigenous populations are found to be in the project area, OP 4.10 will be triggered. This will be defined on a case by case basis.

Safeguard Policies Triggered by the Project	TBD	Yes	No
Environmental Assessment (OP/BP 4.01)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indigenous Peoples (OP/BP 4.10)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Cultural Resources (OP/BP 4.11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projects on International Waterways (OP/BP 7.50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projects in Disputed Areas (OP/BP 7.60)*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

G. Policy Exceptions and Readiness

64. **Policy exceptions.** The Program as a whole is not expected to require any exceptions to Bank policies, but each Phase will be reviewed individually.

65. **Readiness** for Phase 1 is established in the Technical Annex. Readiness for subsequent phases will be established subject to the criteria listed in Section II above.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas

Annex 1: Country Background

PACIFIC REGIONAL CONNECTIVITY PROGRAM

A. Tonga

1. Tonga is one of the more isolated countries in the Pacific region, about 2,000km from New Zealand and over 3,500 km from Australia. It consists of 176 islands with a total area of 748 km², an Exclusive Economic Zone of about 700,000 km², and has a total population of 102,000 spread across 36 inhabited islands. Over 70 percent of the population reside on the largest island Tongatapu where the capital, Nuku'alofa is located. Over the last 15 years, per capita income in Tonga has grown modestly and in 2009 was estimated at US\$3,250. This reflects average real annual growth over the same period of around 1.9 percent, a rate that exceeds population growth by just 0.5 percent.

2. **Tonga's economic fortunes have fluctuated significantly as underlying structural** constraints, political disturbances and global economic developments have adversely affected growth, slowing substantially with the cumulative impact of the food and fuel crises, the global economic slowdown and two serious natural disasters (a tsunami in September 2009 and a cyclone in February 2010).

3. Tonga's recent economic performance underscores the degree to which the country is vulnerable to external economic shocks and natural disasters. The country's small size and its distance from the nearest large markets also means that the country is unable to exploit economies of scale in production. A narrow resource base and small market have resulted in a production structure that is highly undiversified and where remittances from Tongans living and working overseas accounted for an estimated 30 percent of gross domestic product (GDP) and 67 percent of imports prior to the global economic crisis. The principal impact of the global economic crisis was a dramatic decline in remittances as the economic slowdown affected the principal remittance sending countries (Australia, New Zealand, and the United States). Remittances fell by an estimated 10.2 percent in FY2009/2010, following a decline of 13.6 percent in FY2008/2009. Thus far in FY2010/11, remittance receipts have remained flat. Inflation, following the trend of international oil and food prices, reached a peak of 12 percent in mid-2008 but had fallen to 1.2 percent by mid-2009. In 2010, inflation picked up to 5 percent by year-end as commodity prices strengthened, particularly for oil.

B. Vanuatu

4. Vanuatu, with a population of 215,000, consists of around 80 islands and a land area of 12,336 km² spread over 1,300 km from north to south in the Western Pacific. Vanuatu's economy is one of the fastest growing in the Pacific, where sound macroeconomic management and a period of political stability from 2003-10 created an environment for growth in which agriculture, construction, tourism, infrastructure development and foreign direct investment in real estate have each made important contributions. In the period 2004-08, economic growth averaged 6.5 percent and, although Vanuatu was affected by the global downturn in 2009, the economy continued to grow by 4 percent. In 2010-11, however, signs of slowdown began to emerge, with increasing political instability reflected in multiple changes of government.

5. Vanuatu's fiscal position has been strong in recent years with fiscal surpluses averaging over 1 percent of GDP in the period 2004-08. Revenue growth has been underpinned by the strength of

economic activity as well as by efforts to widen the tax base and to improve tax compliance. The fiscal surplus of 0.8 percent in of GDP in 2009 is also extraordinary by regional standards. Vanuatu has systematically used its fiscal surpluses to retire debt, actions that have resulted in a reduction in public debt from nearly 45 percent in 2002 to around 17 percent in 2009. Despite its recent economic success, Vanuatu has not been able to translate this into improved human development outcomes and will need to maintain current levels of economic growth to keep per capita income levels rising.

C. Samoa

6. Samoa is a small nation comprising four inhabited islands in the South Pacific with a total population of approximately 182,000 and total GDP of US\$555 million. The population is predominantly rural—with two-thirds of the labor force engaged in agriculture—and GDP per capita income at market exchange rates is estimated at US\$2,700. Samoa has been a successful market reformer for more than two decades during which time the country has reduced public debt to manageable levels, reduced tariffs, and successfully introduced a comprehensive market-based liberalization program. In addition public enterprises have been progressively corporatized and privatized in an effort to reduce the role of the state in the economy and to improve the efficiency of service provision.

7. Samoa has reaped the benefits of its reforms in sustained economic growth and increases in human development. In the 15 years to 2008, Samoa achieved per capita GDP growth of 5.5 percent, a level significantly higher than for any relevant peer group. However the cumulative effects of the food and fuel crises followed by the global economic downturn and a devastating tsunami, have been severe. Manufacturing employment fell by 9.3 percent in the second quarter of 2009, and real GDP declined by 5 percent in FY2008-09, Samoa's weakest economic performance in two decades. The global economic crisis has significantly affected the country's fiscal position. Against a trend of 3.5 percent per annum, tax revenues declined by 6 percent in FY2007-08, 12 percent in FY2008-09, and are projected to fall by 13 percent in 2009-10.

8. The Government has responded effectively to its economic predicament, formulating a major fiscal stimulus package in the FY2009-10 budget. The Central Bank of Samoa has taken strong measures to ease monetary policy and cushion the impact of the global shocks on the domestic policy. The timing and severity of these shocks has reduced Samoa's ability to recover quickly from the global recession. In response, the IMF approved a US\$9.3 million loan to help spur recovery and reconstruction after the tsunami, and the World Bank has more than doubled Samoa's IDA allocation from US\$18 to US\$40 million including US\$20 million in a development policy credit disbursed on June 30, 2010. The Government remains committed to maintaining macroeconomic stability through disciplined monetary and fiscal policies, and a recent debt sustainability analysis indicates that, despite projected deficits in the next three fiscal years, Samoa's debt outlook remains favorable. Seeking greater integration with its main trading partners, Samoa's Parliament approved a decision in July 2011 to move its time zone one day ahead across the International Date Line, effective December 31, 2011.

D. Solomon Islands

9. The Solomon Islands is an archipelago of 997 islands stretching from Papua New Guinea in the northwest to Vanuatu in the south. It has a total land area of 29,900 km² spread over 1.34 million km²

of ocean. The population of approximately 560,000 is highly dispersed across more than 80 inhabited islands with the result that the country has one of the lowest levels of urbanization in the world. Following two decades of reasonable economic growth and steady social development the country underwent a period of conflict between 1998 and 2003 that had a dramatic impact on the economy. GDP declined by 24 percent between 1998 and 2003. Following the arrival of the Regional Assistance Mission to the Solomon Islands that has helped restore security and order, the country has recorded an average annual growth of 6.9 percent, driven primarily by rapid growth in official development assistance inflows, and the unsustainable extraction and export of natural forest stocks.

10. The impact of the global financial downturn exposed systemic weaknesses in the economy of the Solomon Islands. Growth contracted 2.3 percent in 2009 as a result of a decline in demand for logs from East Asian markets, reduced prices for other agricultural commodity exports, constraints on government spending and the impact of floods on agricultural production. Fiscal revenues in 2009 were 13.5 percent below projected levels and the Government was forced to respond through a range of emergency expenditure and revenue measures. Growth is expected to recover modestly to around 3.5 percent in 2010 but log prices (the country's primary export) are expected to remain weak and, with the impending collapse of natural forest logging, the Solomon Islands faces substantial structural challenges in the coming years.

Annex 2: Sector Overview by Country and Detailed Program Description⁷
PACIFIC REGIONAL CONNECTIVITY PROGRAM

A. Tonga

1. **Access to ICT infrastructure.** Following the introduction of competition in telecommunications in 2002, access to basic telecommunications increased significantly. Mobile teledensity is around 60 percent, among the highest in the Pacific; call tariffs are among the lowest in the region. However, Internet access, particularly broadband, is extremely limited, and prices to end-users are high relative to GDP and to those in neighboring countries, notably Fiji. The market structure is competitive, though a *de facto* duopoly: Tonga Communications Corporation (TCC) which is 100 percent state-owned (though 10 percent of shares are to be sold to the public), and Digicel Tonga (100 percent privately-owned). In 2010 TCC set up a subsidiary, TCL, to own and operate the proposed submarine cable. In March 2011 the Government announced that TCL would be established as a free standing, 100 percent public enterprise, with 20 percent of the Government’s shareholding to be divested at a later stage. Five Internet service providers have been licensed, but only TCC and Digicel currently operate; some large institutions use satellite services.

2. **International connectivity.** The principal constraint to further telecommunications development—including new private investment and market entry—is the limited capacity and high cost of international bandwidth. This is due to Tonga’s dependence on satellite connectivity which is inadequate to meet growing demand for bandwidth and also very costly by international standards. Total demand for bandwidth is projected to increase from the current level of about 22 Megabits per second (Mbps) up to 1.2 Gbps by 2032, driven primarily by increased demand for fixed and mobile broadband. The present cost of satellite bandwidth is US\$3,600 per Mbps per month; this is expected to fall below US\$400 per Mbps per month with a submarine cable connection to SCCN.

Table 2.1. Telecommunications in Tonga, June 2011

Service	Penetration (% pop.)	Market Structure
Fixed lines	13	TCC)
Mobile	59	TCC, Digicel
Internet (dial-up)	2	TCC, Digicel
Internet (mobile)	<1	Digicel (GPRS); TCC (planned GPRS)
Internet (broadband)	1	TCC, Digicel. Three other licensed Internet service providers (not active)

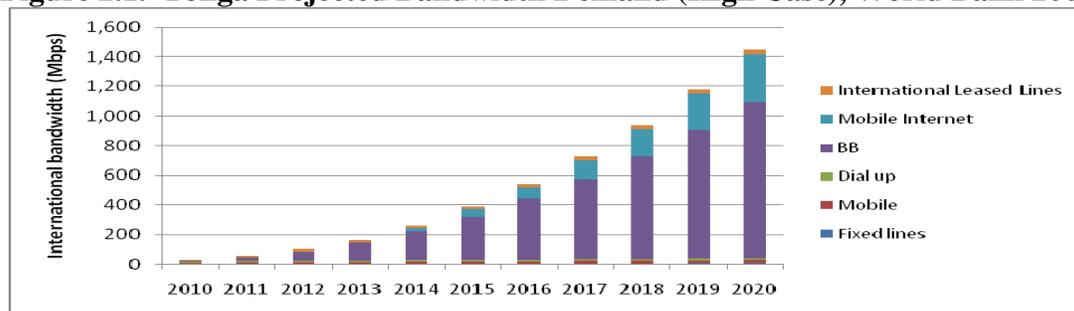
Sources: Ministry of Information and Communications, operators, ITU

3. **Enabling environment.** Until 2008, telecommunications policy and regulation were the responsibility of the Prime Minister’s Office. A new sector ministry, the Ministry of Information and Communications was established in 2009. The legal framework applicable to telecommunications in Tonga consists primarily of the Communications Act 2000, as amended (Act) and the TCC Act 2000,

⁷ This Annex focuses on the ICT sector for each country. Issues related to the legal and regulatory framework using waters (international, exclusive economic zone, territorial, etc.) as well as for landing a cable in each country are dealt with in detail in the respective Project Technical Annexes.

and the regulations there under. The Act provides for the issuing of both individual and class licenses. Licenses have been issued to both TCC and Digicel. Among these licenses are an “individual license” each for TCC and Digicel to operate a satellite earth station and to provide retail international telecommunications services. An individual license will also be issued to TCL on an interim basis, and will be harmonized with the new legal and regulatory enabling framework described below.

Figure 2.1. Tonga Projected Bandwidth Demand (High Case), World Bank 2009



4. According to the Ministry of Communications, regulations need to be issued in the following areas to give effect to the Act: consumer protection, a range of technical regulations (which are understood to mean frequency management, among others), “economic” regulations (which are understood to mean competition and interconnection). No regulations regarding tariffs and licensing have been promulgated. The Phase 1 Tonga-Fiji Connectivity Project will provide legal and regulatory TA to assist the sector ministry/regulator in elaborating these and other regulations to give effect to the Act; as well as to introduce updates and reforms generally to the overall legal and regulatory enabling framework in order to, *inter alia*, introduce international best practice, ensure that the legal and regulatory enabling framework supports Project objectives, as well as implementing Tonga’s specific commitments regarding telecommunications made to the World Trade Organization. TCL’s interim license will be harmonized in accordance with this new framework and converted to an ordinary license.

5. Increasing access to international broadband capacity and its distribution domestically also heightens the need to focus on aspects of the legal and regulatory enabling environment around the use of the Internet, including e-commerce (legal equivalence of e-contracting, e-signature and e-documents), cyber-security, (cybercrime) and digital data privacy protection. Tonga has enacted a Computer Crimes Act (2003), which appears to cover the basic elements of cybercrime that would be found, for example, in such international benchmarks as the Council of Europe Cybercrime convention. The Phase 1 Project will be funding technical assistance in the area of legal and regulatory enabling environment for Internet.

B. Fiji

6. **Access to ICT Infrastructure.** Fiji’s telecommunications market structure is diverse and competitive. Access, variety, and quality of service and pricing are favorable relative to the rest of the Pacific region. Fiji’s demand for bandwidth is expected to surpass 5 Gbps by 2017, to be met by the SCCN. In addition, Fiji is looking to position itself as the regional telecommunications and ICT hub.

Table 2.2. Telecommunications in Fiji, June 2011

Service	Penetration (% pop.)	Market Players
Fixed lines	15.0	Telecom Fiji Ltd (TFL)-fixed and fixed wireless, Fintel
Mobile*	83.2	Vodafone, Digicel, Inkk
Internet (dial-up)	2.0	TFL
Internet (mobile)*	16.2	Vodafone, Digicel
Internet (broadband)	2.8	TFL, Fintel (Kidanet), Connect, Unwired,

Sources: Telecommunications Authority of Fiji, Commerce Commission, operators, ITU.* Mobile subscribers includes number of active subscriptions including to more than one provider.

7. Enabling environment. Fiji liberalized its telecommunications market in 2008, following the adoption of a pro-competitive sector policy end-2006. The interim Government renegotiated the exclusive licenses of Telecom Fiji Ltd., Vodafone and FINTEL in late 2007. These negotiations culminated in the signature of a Deed of Settlement, known as the “Radisson Agreement”, subsequently ratified in December 2007. The Deed of Settlement provided for the progressive opening up of the entire telecommunications market to competition, the phasing in of a uniform “class” licensing regime, and the establishment of an independent regulator. The Government subsequently concluded a competitive selection process for a second mobile telecommunications network, awarding a licence to Digicel in July 2008 (effective October 1, 2008).

8. New legislation, the Telecommunications Promulgation (Law), was adopted in August, 2008 which provides, *inter alia*, for the establishment of the regulatory body, the Telecommunications Authority of Fiji. The World Bank is providing technical assistance to the Telecommunications Authority of Fiji under a recently-approved Institutional Development Fund Grant. The Telecommunications Authority of Fiji operates in coordination with the multi-sector competition regulator, the Commerce Commission (both have independent boards). Thus, the three institutions with sector oversight responsibility are as follows:

- Policy: Ministry of Public Enterprise, Tourism and Communications (effective 2010)
- Technical regulation: Telecommunications Authority of Fiji
- Interconnection and Price Regulation: Commerce Commission

9. Fiji’s regulatory framework supports open access. The international gateway has been liberalized. Moreover, through a determination by the Commerce Commission in June 2010, Fiji has liberalized access to the SCCN, enabling any operators to purchase capacity directly from SCCN.

C. Vanuatu

10. **Access to ICT Infrastructure.** Vanuatu has experienced dramatic improvements in access to ICT infrastructure and services over the past three years. Following the introduction of competition in mobile telecoms in 2007 the number of mobile subscribers increased from 11 percent to over 50 percent of the population. Mobile network coverage now exceeds 85 percent of the population. With the planned launch of a universal access program supported by AusAID, population coverage is expected to reach 95 percent by end 2011. Internet subscriptions are growing. Telecom Vanuatu Ltd has been upgrading its core network, particularly with the roll-out of optical fiber around the capital of Port Vila and installation of additional ADSL equipment. Digicel is offering 2.5 G (GPRS) service

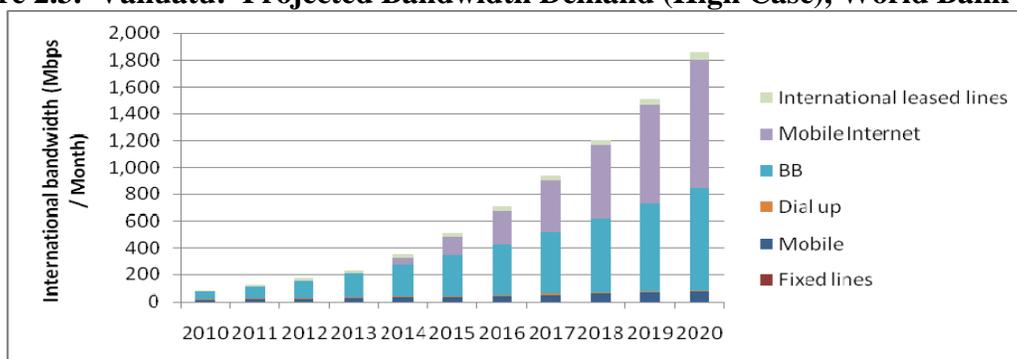
which offers some data transmission capability and light Internet browsing. Eight new communications companies, including Internet service providers, were licensed in 2009 though not all have launched. Constraints to new service provision include some issues with regard to wholesale access pricing from Telecom Vanuatu Ltd (currently being addressed by the Regulator), as well as the high cost and limited capacity of international satellite bandwidth.

Table 2.3. Telecommunications in Vanuatu, June 2011

Service	Teledensity (% pop.)	Market Players
Fixed lines	3.0	Telecom Vanuatu Ltd (TVL)
Mobile	72.0	TVL, Digicel
Internet (dial-up)	10.0	TVL
Internet (mobile)	...	TVL, Digicel
Internet (broadband)	1.0	TVL, SPIM, Telsat Broadband Ltd, Can'l Holdings Ltd

Sources: Telecommunication and Radiocommunication Regulator, operators, ITU. A total of 12 service licences have been issued.

Figure 2.3. Vanuatu: Projected Bandwidth Demand (High Case), World Bank (2009)



11. **International connectivity.** Under a high case demand scenario, Vanuatu’s international bandwidth requirements are expected to rise from the current level of about 80 Mbps to exceed 2 Gbps by 2032. Currently both service providers rely on relatively expensive satellite links. A review of potential cable options concluded that the best link option, taking into account capital and backhauling costs would be a cable to the SCCN landing station in Fiji. Other cable routes were also considered, in particular a route to New Caledonia with lower capital investment requirements. However, backhauling costs and other implementation factors made the Fiji/Southern Cross option more attractive. The Bank has undertaken a preliminary analysis of technical, financial, legal/regulatory and environmental implications of such a Project, and has also indicated potential financial support, subject to public funding requirements and Government demand. Other potential investors (private, public), including possible institutional investors in Vanuatu, have also expressed interest. The final financing and implementation arrangements for the project, including the nature of public sector involvement, are still under discussion among the prospective parties.

12. **Enabling environment.** The telecommunications market in Vanuatu is fully liberalized. A Settlement Agreement terminating the exclusive franchise agreement of the incumbent operator,

Telecom Vanuatu Ltd was agreed in December 2007 and became effective in March 2008. Following this agreement new nonexclusive licences were issued to Telecom Vanuatu Ltd for the provision of telecommunications services and to Digicel Vanuatu Limited (Digicel) for the provision of mobile services in Vanuatu. Digicel launched service in July 2007. Under the terms of the Settlement Agreement, additional mobile telecommunications licenses must not be issued within six months of the effective date of the Agreement, and a third mobile telecommunications license may not be issued within 36 months of the effective date of Agreement. Following and as anticipated in the Settlement Agreement, a new sector law was passed in 2009, which, *inter alia*, established the independent regulator. Technical assistance for telecoms/ICT policy and regulation is being provided under a PRIF grant (Telecommunications/ICT TA, US\$2.8 million, 2009). A significant regulatory agenda lies ahead, including in the areas of spectrum, numbering management, interconnection, quality of services and convergence-related issues. Specific provisions covering open access and wholesale pricing will need to be issued to support a regional cable project.

D. Samoa

13. Access to ICT infrastructure. Samoa introduced competition in mobile communications in 2006 and witnessed a significant increase in teledensity from about five percent of the population to over 50 percent. Over 95 percent of the population is now within range of mobile networks. Access to Internet has improved slowly with the majority of users still relying on dial-up connections.

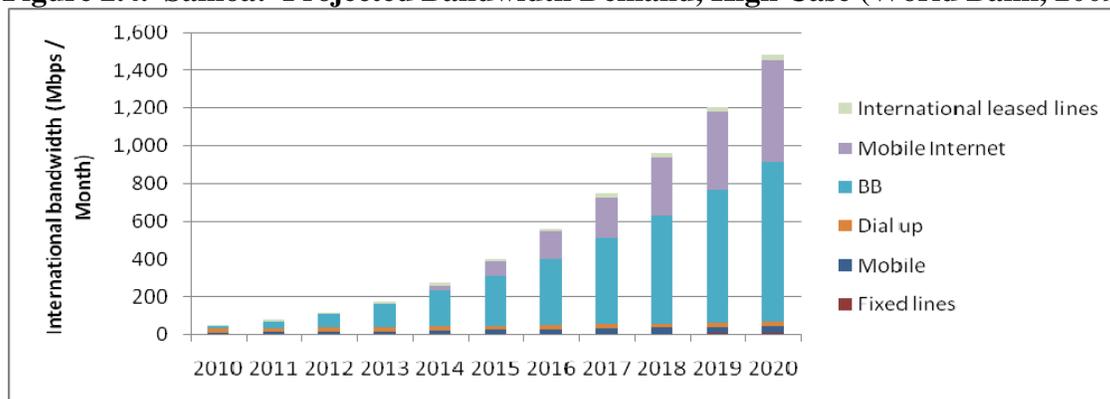
Table 2.4. Telecommunications in Samoa, December 2010

Service	Penetration (% pop)	Market Players
Fixed lines	6.0	SamoaTel
Mobile	51.0	SamoaTel, Digicel
Internet (dial-up)	2.1	SamoaTel, LeSamoa, CSL
Internet (mobile)	...	
Internet (broadband)	1.6	SamoaTel, CSL

Sources: Office of the Regulator, Ministry of Communications and Information Technology, operators, ITU

14. International connectivity. Demand for international bandwidth is projected to grow from current levels to over 1.4 Gbps by 2020. Samoa’s short-term bandwidth needs are being addressed by the Samoa-American Samoa cable, a spur connecting to the American Samoa-Hawaii cable (a reconditioned part of the former PACRIM East system). The Government purchased capacity in the amount of two DS-3 connections (each at 45 Mbps—one for the Government’s direct use and the other for SamoaTel. Samoa is now looking at alternative projects to secure long term access to fibered capacity. A review of options has indicated that the most feasible point-to-point cable options for Samoa include: (a) a repeatered cable to the SCCN in Fiji (US\$ 43 million) which currently offers the best backhauling costs; (b) an unrepeatered cable to Tonga that would (if this goes ahead) allow connecting the Tongan islands groups of Ha’apai and Vava’u (US\$41 million), or a spur to the proposed Auckland-Los Angeles Pacific Fiber project. A project steering committee has been formed to evaluate these options and possible financing models.

Figure 2.4. Samoa: Projected Bandwidth Demand, High Case (World Bank, 2009)



15. Enabling environment. Supported by the first IDA project in the sector in the region (Samoa Telecommunications and Postal Sector Reform Project, US\$4.5 million, 2003), Samoa has completely liberalized its telecommunications market. Samoa adopted a pro-competitive sector policy (2005), and new legislation (Telecommunications Act, 2005) that paved the way for partial liberalization in 2006, and full sector liberalization in July 2009. Under the 2005 Act, a new independent regulatory body was created, and the award of a second mobile telecommunication license, to Digicel, was made after an open and internationally competitive tender process. With regard to regional connectivity, the government has issued the Policy on Competition in the International Telecommunications Markets (February 2008); and a policy statement on Submarine Cable and International Gateway Services (March 2009). The regulatory arrangements for open access to submarine cable systems have yet to be fully put in place; this has been an issue with access to the American Samoa Hawaii cable. Interconnection, collocation, and wholesale pricing also need to be addressed.

E. Solomon Islands

16. Access to ICT infrastructure is still very limited due to the legacy of the monopolistic market structure in place until December 2009, and delays in the launch of a new mobile service provider. As of end-2010, there were 12,000 fixed lines in service and 130,000 mobile subscribers. The number of mobile subscribers is expected to increase significantly over the next year as the new mobile entrant meets its coverage obligations, and the incumbent responds to new competitive pressures. Internet access is primarily via dial-up, with fewer than 1,000 broadband (ADSL digital subscriber line) subscribers. Prepaid wireless local area network access is available in Honiara in selected “WiFi Hotspots.” STL and bemobile are developing mobile broadband (3G) capability.

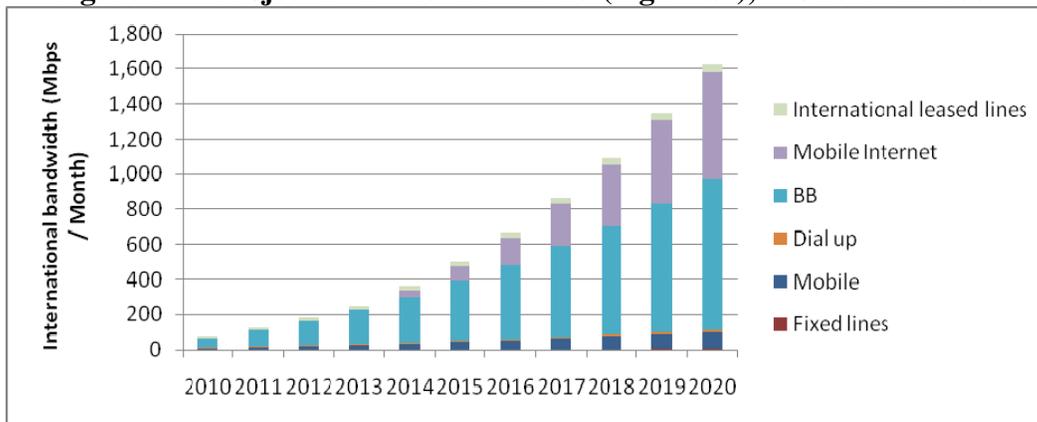
Table 2.5. Telecommunications in Solomon Islands, December 2010

Service	Penetration (% pop.)	Market Players
Fixed lines	2.0	Solomon Telekom Ltd (STL)
Mobile	24.0	STL, bemobile
Internet (dial-up)	0.2	STL
Internet (mobile)		STL, bemobile
Internet (broadband)	0.8	STL * (4 new ISPs registered but not launched)

Sources: Telecommunications Commission of the Solomon Islands, operators, ITU.

17. **International connectivity.** Demand for bandwidth is projected to grow from current levels to about 1.6 Gbps by 2020. The high cost of international satellite services is a very significant barrier to expansion of Internet access in the Solomon Islands. A technical, economic and financial analysis (World Bank/Polyconseil, 2009) has indicated that a spur to the Pipe Networks PPC-1 cable connecting Sydney to Guam seems to be the most financially attractive cable option for the Solomon Islands. The costs would include capital investment in the order of US\$38 million plus the cost of an IRU. It might be possible to share the IRU cost with another PPC-1 user. An advisory group comprising representatives of the sector ministry, the Regulator, the Ministry of Finance, and representatives from the telecommunications industry has convened to consider a possible project, including financing and management options.

Figure 2.5. Project Bandwidth Demand (high case), World Bank 2009



18. **Enabling environment.** The telecommunications market in Solomon Islands is fully liberalized. The Solomon Islands Government has undertaken a major reform of the country's telecommunications sector. In 2008 the government adopted a pro-competitive policy. In 2009 it negotiated the termination of Solomon Telekom Limited (STL)'s exclusive licence to supply telecommunications service; licensed a second mobile operator, bemobile, which launched service on August 31, 2010; passed the Telecommunications Act 2009 establishing a regulatory framework for a competitive market; and created a sector regulator, the Telecommunications Commission of the Solomon Islands, entrusted with furthering liberalisation. An IDA grant, co-financed by AusAID (Telecommunications and ICT Development Project, US\$5.9 million, 2010) is providing technical assistance to TCSI on a range of regulatory matters.

19. The Telecommunications Act precluded anyone other than STL and bemoobile from providing telecommunications services until 1 April 2011. The sector is now fully liberalized, and general licences/authorizations and guidelines for their application and award have been developed and are available to interested parties. The Telecommunications Commission of the Solomon Islands has started working on a range of basic regulations, which will include appropriate provisions for submarine cable access and wholesale pricing.

F. Program Components

20. In light of the sector context above, the Pacific Regional Connectivity Program will be structured around three components to: (a) support connectivity, (b) create an enabling environment and (c) support implementation.

Component 1- Infrastructure Component: Supporting Connectivity

21. **International connectivity components focus on connecting countries to submarine fiber-optic cables.** The international connectivity component will focus on: (a) support to provide access to those countries without established access to international submarine cable connectivity; and (b) support to countries with limited/indirect access to have alternative access to improve terms of access to capacity and lower cost

22. Specific activities under this component could include: (a) supporting the cost of connectivity to international cables, or (b) buying capacity at reduced cost to facilitate Government applications.

Component 2 - Creating an Enabling Environment for Connectivity and Applications

23. The enabling environment component is expected to consist of some or all of the following:

- (a) **Create a policy and regulatory environment to allow competition.** In addition to transaction design, this component will focus on addressing policy and regulatory bottlenecks at national levels to maximize the benefits of the proposed connectivity agenda. Targeted support will be designed for each country and will be detailed in technical annexes for each phase.
- (b) **Strengthen institutional capacity at the international and national level.** Significant institutional strengthening support is needed to ensure that the open access principles are implemented effectively. In addition, institutional strengthening will focus mostly on strengthening of capacities at national level on a case by case basis.
- (c) **Use of public-private partnerships (PPP) to ensure open access.** This component will focus on the transaction design and operating model for financing, ownership, governance and management and operation of international, regional and national infrastructure using PPP frameworks and related open access principles to create an enabling environment for improved connectivity. The PPP framework would focus on principles of open and non-discriminatory access while maximizing the role of the private sector.

Component 3: Implementation support, communications and M&E

23. **Capacity strengthening to ensure effective implementation.** This activity will provide support needed to strengthen the capacity of the Governments to implement the connectivity project, including setting up the PMUs, as necessary (with project management, financial management and procurement expertise). Technical specialists may also be hired if required for implementation of the project. The component will also cover office equipment, incremental operating costs, audits, communications and environmental and social studies.

Annex 3: Results Framework and Monitoring
PACIFIC REGIONAL CONNECTIVITY PROGRAM

Results Framework

PDO	Program Outcome Indicators	Use of Program Outcome Information
<p>The objective of the Pacific Regional Connectivity Program is to reduce the cost and increase the availability of international bandwidth for participating countries, and thereby facilitate the development of a wide range of ICT applications to support social and economic development in the Pacific region.</p>	<p>Increased infrastructure capacity:</p> <ul style="list-style-type: none"> • Volume of international traffic (Mbps) <p>Improved enabling environment [for projects with this component]</p> <ul style="list-style-type: none"> • Legal and regulatory framework more effective at delivering sector performance • Improved capacity of the regulatory institution (s) to deliver on their mandates • Increased level of competition in the ICT sector • Improved ICT policy environment in the country <p>Increased access to ICT infrastructure and services using two proxies:</p> <ul style="list-style-type: none"> • Access to Internet services (per 100 people) • Access to telephone services, mobile (per 100 people) <p>Reduced price of international communications</p>	<p>Assess trends in international communications and regional communications integration</p> <p>Assess level of access to communications services within targeted countries</p> <p>Assess competitiveness of countries with regards to cost of capacity</p>
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring
<p>Component 1. Infrastructure: Expansion of infrastructure</p>	<p>Length of fiber optic networks built (km)</p> <p>Direct project beneficiaries (% female)</p>	<p>Monitor deployment of submarine cable</p> <p>Monitor levels of access to services</p>
<p>Component 2. Enabling Environment: Increased regulatory capacity Increased competition Sound market environment conducive for investment and competition</p>	<ul style="list-style-type: none"> • Price of wholesale international capacity link • Volume of international traffic (Mbits/s) • Number of market players buying capacity at the landing station <p>Prices of calls and Internet access</p> <ul style="list-style-type: none"> • Average per minute cost of international mobile calls • Retail price of Internet services (per Mbps per month, in US\$) 	<p>Assess competitiveness of countries with regards to cost of capacity</p> <p>Monitor sector competitiveness and assess level of affordability of services at retail level</p>

Arrangements for Results Monitoring [Framework for Projects]

Project Outcome Indicators	Baseline (2010)	Target Values					Data Collection and Reporting			Notes
		YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection	
International Internet bandwidth							Yearly	[indicator available at ITU and Telegeography]	Regulator	Measured in the total Mbit/s simplex (i.e., unidirectional traffic) to european hub destination currently used by the market. Excludes cost of far-end connection to Internet.
Increased capacity of Regulator to deliver on its mandate (0-5)							Yearly	Annual Report	Regulator	Will be monitored in projects that support the enabling environment
Increased level of competition in the ICT sector (no. of service providers)							Yearly	Annual Report	Regulator	Assumes increase in the number of Internet Service Providers
Access to Internet services (per 100 people)							Yearly	[indicator available at ITU and Telegeography]	Regulator	Defined as no. of subscribers with 128Kbit/s broadband connection or faster
Access to telephone services, mobile phone (per 100 people)							Yearly	[indicator available at ITU and Telegeography]	Regulator	Mobile penetration is considered a more meaningful indicator than fixed line penetration which is expected to remain steady or possibly decline.
Intermediate Outcome Indicators										
Component 1. Length of Fiber Optic Network Built (km)							Yearly	Implementing entity progress report	Regulator	The definition of "built" means the condition that the fiber optic cables are physically laid regardless lit or in use. The measure would be in terms of "route kilometers" not in actual length of fiber.
Direct project beneficiaries (people, % female)							Yearly	Implementing entity progress report	Regulator	Beneficiaries identified in terms of increased Internet subscribers
Component 2. Price of wholesale international capacity link							Yearly	Telecommunications service providers report	Regulator	Price measured in US\$ per month. Baseline price calculated on basis of US\$2500 per Mbit/s on satellite (x4 to calculate E1 equivalent)
Component 2. Volume of international traffic (Mbps)							Yearly	Telecommunications service providers	Regulator	
Component 2. Average per minute cost of international mobile call							Yearly	Telecommunications service provider data	Regulator	Off-peak prices for highest-traffic destinations

Project Outcome Indicators	Baseline (2010)	Target Values					Data Collection and Reporting			Notes
		YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection	
Component 2. Retail Price of Internet Services (per Mbps per Month, in US\$)										The rate would include monthly line rental, line usage charge plus any tax that may be levied. Rates could be compared at the start and end of the period. This requires conversion of the advertised speed to the standardized unit (e.g., a 256 kbit/s connection would be multiplied by 4 whereas a 4 Mbit/s connection would be divided by four)..

Annex 4: Program Implementation Arrangements
PACIFIC REGIONAL CONNECTIVITY PROGRAM

A. Project Management

1. **Project administration mechanisms.** The administration of the program will include, at the national level, the respective line ministries or other Project implementing entities, with administrative support through PMUs as needed; national level steering committees providing guidance to implementing entities and regional institutions to ensure that the Projects' regional aspects are well reflected during implementation. The PMUs will typically include expertise in project management, procurement, and financial management. Technical specialists may also be hired if required for implementation of the project. Technical specialists could also be hired for more than one country to minimize cost, to the extent feasible.

2. Project implementing entities at the national level will be Grant/Credit Administrator and coordinate all financial management and procurement. Financial management and procurement capacity assessments will be undertaken during Project preparation. **Procurement will be carried out in accordance to World Bank guidelines.** Procurement for the proposed program would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004, revised October 2006 and May 2010; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, revised October 2006 and May 2010, the IDA Anticorruption Guidelines dated July 1, 2005 and as amended through October 15, 2006; and the provisions stipulated in the Grant Agreement and Legal Agreements of each project.

3. During implementation, the PMUs will be responsible for: (a) maintaining an appropriate information system for tracking progress in all project subcomponents, both in terms of financial performance and meeting implementation targets and monitor the performance of all contractors under the project; and (b) preparing annual work programs and budgets, and if necessary, reviewing, in consultation with IDA, the reallocation of resources across the various components of the project as lessons emerge as to patterns of demand and development impact. PMU establishment will be required prior to Project Effectiveness.

4. Steering committees will be established with representation from the private sector and civil society, as appropriate. As some Projects may take the form of PPPs and involve ministries outside the ICT sector (e.g., finance, planning), it is proposed that steering committees with representatives from Governments, regulatory authorities, private sector and civil society will be considered to provide overall guidance to the Project implementing entities. Detailed terms of reference for steering committees will be discussed on a case-by-case basis.

B. Safeguards

5. **Social.** The program as a whole is expected to have many positive social impacts by improving access to communications. Appropriate safeguard documentation will be prepared for each Project. Land acquisition or livelihood impacts will be assessed on a project-specific basis, and mitigation plans prepared accordingly. Where involuntary land acquisition and/or

resettlement are confirmed and specific project areas are known prior to appraisal resettlement n Plans will be prepared. Where involuntary land acquisition and /or resettlement is not confirmed or specific project areas are unknown prior to appraisal then a resettlement policy framework (RPF) will be prepared. Each project will need to assess whether there are indigenous people located in the project area. If indigenous people are found to be in the project area, an Indigenous People's Plan must be prepared by the client as per World Bank policy OP 4.10. If indigenous people are potentially found in the project area, but it will be unclear until detailed design, an Indigenous People's Framework must be prepared. If the policy is triggered free, prior and informed consultations that can lead to broad community support for the project will also be necessary.

6. **Environment.** The physical components of this Program will mostly be limited to the deployment of submarine cables and of the landing stations where required. The risks associated with the kind of infrastructure financed under this Program are generally low to moderate, and the Program therefore assigned to environmental category B under OP 4.01. OP 4.04 is also likely to be triggered. Land acquisition for terrestrial facilities may trigger OP 4.12 Involuntary Resettlement, but will be evaluated on a case by case basis. EAs and corresponding EMPs will be undertaken to cover submarine cables and all associated/ancillary structures.

7. Although support for domestic backbone infrastructure is not anticipated at this stage, where applicable, ESMF would be prepared in this case. Land use requirements, in particular for cable landing stations, will be carefully reviewed during the preparation stage. Prior to Project appraisal, any EAs, EMPs, land acquisition and resettlement action plan/frameworks and ESMF—if applicable—will be reviewed by the World Bank and publicly disclosed in all participating countries as well as in the World Bank's InfoShop. Specific EMPs will be prepared as necessary for terrestrial facilities during Project implementation, in line with the EAs, once the locations of those facilities have been identified.

C. Monitoring and Evaluation

8. Project implementing entities will monitor and evaluate national projects and, as such, will establish standard formats and guidelines for data collection and reporting, and will organize training sessions for project stakeholders in their use. As indicated above, an M&E system will be set up within the entity to keep track of and evaluate implementation progress of the proposed Project within the broader context of the institutional framework for the telecommunications sector. Although increased geographical reach and reduction of costs at the country level remains the hallmark of success of an enabling environment, the Project's M&E system will seek first to measure results that are closely associated with project activities.

D. Role of Partners

9. The World Bank will work with other partners, including bilateral, multilateral financiers, regional organizations and the private sector. At the program level, different partners expressed interest to co-finance including the ADB, PRIF, and IFC. The specific modalities of cooperation and amounts are still under discussion and will depend on country needs and circumstances.

10. All financing institutions will agree to a policy of open access and pro-competitive frameworks for telecommunications/ICT infrastructure to ensure competitive access by all operators and service providers to infrastructure funded through development partners, and reasonable certainty that entrants will be able to compete on a level playing field (including transparency of terms and conditions; fair and coherent technical access and pricing. At the Project level, donor cooperation will be discussed on a case-by-case basis depending on specific partners' activities in given countries and will likely adopt a parallel financing strategy. Those details will be included in country specific technical annexes.

Annex 5: Documents in the Project File
PACIFIC REGIONAL CONNECTIVITY PROGRAM

1. World Bank/Polyconseil: *Regional Telecoms Backbone Network and Implementation Options Study* (2009); *Technical, Economic and Financial Connectivity Study for Tonga*, 2010
2. World Bank/Mallesons Steven Jacques: *Legal and Regulatory Reports: Fiji, Samoa, Solomon Islands, Tonga, Vanuatu*, 2010
3. Secretariat of the Pacific Community: *Framework for Action on ICT Development in the Pacific* 2010.
<http://www.itu.int/wsis/stocktaking/docs/activities/1306769130/Final%20Pacific%20ICT%20Framework.pdf>
4. Sample terms of reference for the Environmental and Social Impact Assessment for Phase X, Country X Connectivity Project under the Pacific Regional Connectivity Program.

Annex 6: Environmental and Social Management Framework

PACIFIC REGIONAL CONNECTIVITY PROGRAM

A. Introduction and Program Description

1. **Program background.** The development objective of the Pacific Regional Connectivity Program (the Program) is to reduce the cost and increase the availability of international bandwidth for participating countries and thereby facilitate the development of a wide range of ICT applications to support social and economic development in the Pacific region. Specifically, the Program aims to connect Samoa, Solomon Islands, Tonga, and Vanuatu by submarine fiber optic cables to the global communications network. This may be via Australia, Fiji, New Caledonia, and the United States, and ultimately create a Pacific regional communications network. Smaller Island economies may also be connected in outer years, by cable or satellite. The Program will be financed by the World Bank, ADB, participating member countries, and potentially other private and public sector partners. The proposed lending instrument for the World Bank is a Regional IDA horizontal APL. The APL is structured in “horizontal” phases in order to allow participation of different countries as and when they express demand and demonstrate readiness to participate.

2. **Proposed program components** will depend on the specific needs of each participating country. The “menu” of possible components therefore includes the following:

- *Component 1. Broadband infrastructure investment.* For Samoa, Solomon Islands, Tonga, and Vanuatu this will likely include the costs of marine survey, plant and equipment, terminal station and equipment (landing station), cable deployment and maintenance for an agreed contractual period, and contingency. For smaller countries with lower projected bandwidth demand, this could include financing for shared satellite facilities.
- *Component 2. Enabling Environment Technical Assistance:* this will include advisory assistance regarding the legal and regulatory enabling environment and capacity building on telecommunications/ICT policy and regulatory issues, including advice on government ICT applications as required. For the Program phases noted above, this would focus on Tonga and Samoa (and possibly smaller countries in the outer years). Solomon Islands and Vanuatu already receive technical assistance on telecommunications regulation through ongoing operations;
- *Component 3. Project management support to the implementing entity.* This will include technical assistance for project coordination, procurement, financial management, and audit.

3. **Phase 1** of the Program will support the construction of a submarine cable connection from Tonga to Fiji, addressing Tonga’s medium-term bandwidth requirements, and facilitating communications, trade and services between Tonga and Fiji. The expected benefits to Tonga include: new opportunities for economic diversification particularly in the services sector; improved access to Government services and mobilization of ICT for education. The Project will be implemented primarily by a corporation, TCL. Phase 1 Project Components are as follows:

- (a) *Component 1.* Submarine Cable System (US\$32.6 million). This will finance the construction of an 827 km repeatered cable linking Nuku'alofa (Tonga) with Suva (Fiji) plus a landing station in Tonga. The cost includes cable materials, marine survey and laying costs, and cable equipment. In Fiji, the cable will be connected to the existing SCCN landing station in Suva. The SCCN connects Fiji with Australia (Sydney) and the United States (Hawaii).
- (b) *Component 2.* Enabling Environment, (\$1.0 million) will finance technical assistance for the Ministry of Information and Communications on (i) telecommunications policy, legal and regulatory development, and on the legal and regulatory environment for Internet and e-transactions, and (ii) regulatory capacity building.
- (c) *Component 3.* Project Management and Administration (\$0.4 million) will provide administrative support to TCL and to the Ministry of Information and Communications in the areas of project management, procurement, financial management, communications strategy and audit.

4. **Requirements for a program environmental and social management framework.**

Phase 1 of the Program is being appraised concurrently with the Program as a whole. This means that the Phase 1 Program is being fully prepared for implementation as soon as the Program is approved for funding by the World Bank. Subsequent phases will be prepared and implemented on a rolling basis after the Program becomes effective. Therefore, for Phase 1, the ESIA for compliance with the World Bank's safeguards policies and those of the Government of Tonga have been completed by TCL, the implementing entity for Phase 1. The Phase 1 Safeguards documentation has been subject to consultations both in Tonga and in Fiji, has been reviewed and cleared by the World Bank and the Governments of Tonga and Fiji, and has also been disclosed both locally in Tonga and Fiji, and at the World Bank's InfoShop.

5. However, since future phases of the Program have yet to be prepared and will not be appraised by the World Bank by the time of approval of the Program as a whole, this ESMF is being prepared to document the processes and requirements for future phases to guide compliance with World Bank Safeguards policies. The World Bank task team will discuss compliance with the requirements of the ESMF with the respective implementing agencies and their Governments for Phase 2, 3, 4, and 5. The compliance with this ESMF will also be established as a condition of appraisal of future phases, and include as a covenant in financing agreements between the World Bank and counterpart Governments.

B. Environmental and Social Aspects of the Program.

6. **Key Environmental Issues**

- (a) **Sensitive marine environments:** The marine environment around and between the Pacific Island countries participating in this Program is home to some of the most sensitive and diverse aquatic habitats and species in the world. For example corals, hydrothermal vents and seamounts are located throughout this marine environment, and there is a significant presence of cetaceans, turtles, and fish in the area.

(b) **Potential environmental impacts:** The Program will mostly be financing submarine fiber optic cables between land based landing stations on coastal areas as described earlier. The cables are designed to sink to the bottom of the seabed and anchored by their own weight as they are being laid. Therefore there will be no sea-housed infrastructure required to hold them down. In each case, the exact cable routes will be determined by a marine survey that will also map out the locations of all the sensitive ecosystems, and the laying of the cables will be done by a specialized ship guided by sonar and other systems. The final cable routes will be chosen to avoid hydrothermal vents and seamounts given that the physical conditions at these locations would destroy the cable. Given these considerations, the Program is unlikely to significantly impact the marine environment and sensitive ecosystems and species during the laying of the cable (i.e., the construction phase). Therefore, any impacts that occur are likely to be short-term, and will not lead to induced and/or cumulative impacts. Operational phase impacts are likely to be even less significant than the construction phase impacts. The use of sonar may be a nuisance to cetacean communities, but this risk will be mitigated by best practice procedures contained in Appendix 1 of this ESMF. Notwithstanding, the implementing agency for each phase will prepare a detailed and comprehensive ESIA and corresponding EMP that will be required to meet the national environmental laws and the World Bank's own safeguards policies. A sample terms of reference for the required ESIA and EMP is included in the Project files.

7. **Key Social Issues**

- (a) **Land acquisition, disruption of livelihoods:** Individual projects under the Program have the potential to disrupt the livelihoods of fishers or other users of marine resources during the laying of the cable in the various locations. These impacts are expected to be small and temporary and can be mostly mitigated by the EMP of each project. For example, the exact positioning of the cable may be able to be moved slightly so it does not disrupt fishery activities. The location of landing sites could also result in the acquisition of land unless it is already government-owned or leased. If any potential impacts are expected, the Project will trigger the World Bank's Involuntary Resettlement Policy OP 4.12. As such, any impacts that cannot be mitigated and are experienced need to be properly compensated. These include impacts regarding land acquisition, resettlement, access to assets, structures, loss of assets (including crops, trees, and fish), impacts to businesses and any other livelihood impacts. If potential impacts are unknown prior to the detailed design of a project a RPF must be prepared by the client. If exact impacts are known prior to detailed design, an RP needs to be prepared.
- (b) **Consultations:** consultations will need to be a feature of project preparation and implementation. Potential impacts need to be identified together with potentially affected stakeholders. Local people impacted by the project—as well as others with an interest in the project, including nongovernmental organizations and relevant government agencies—should be consulted during project preparation to inform them of the project. Consultations will also need to take place to disclose relevant safeguard documents such as EMP and, if relevant, RPF or RP. During project implementation consultations will need to take place with affected people to ensure they are properly compensated for

impacts experienced. If the World Bank's policy OP 4.10 on Indigenous Peoples is triggered (below) free, prior and informed consultations that can lead to broad community support for the project will also be necessary.

- (c) **Indigenous Peoples:** Each project will need to assess whether there are indigenous people located in the project area. Under Operational Policy 4.10 Indigenous People is a term used to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (b) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; (c) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and, (d) an indigenous language, often different from the official language of the country or region. If indigenous people are found to be in the project area, the World Bank's Indigenous People's policy OP 4.10 will apply.

8. The World Bank safeguards policies that may be triggered by the Program are the following:

- (a) *Environmental Assessment OP4.01* – Requires classification of projects proposed for funding based on impacts and requires full EIA for category A and B projects. Based on the impacts identified in the ESIA for the Phase 1 project (i.e., Tonga- Fiji Connectivity Project) the similarity of the investments in Phase 1 with those likely to be in Phase 2, 3, 4 and subsequent phases and similarity of the marine environment around these island countries, the Program as a whole has been assigned an EA category of “B.” Therefore, a comprehensive ESIA and corresponding EMP will be required for each phase of the Program (i.e., for each project).
- (b) *Natural Habitats OP4.04* – Prohibits the World Bank from financing projects that in the World Bank's opinion, involve the significant conversion or degradation of critical natural habitats as defined in the policy. The issue of impacts on natural habitats including critical natural habitats will be thoroughly examined in the ESIA and managed as necessary in the EMP.
- (c) *Involuntary Resettlement OP4.12* – As noted above, if people experience, or may potentially experience, impacts as a result of the project including resettlement, land acquisition, impacts to access to assets, impacts to assets (including trees, crops, fish), structures, impacts to businesses or any other livelihood impacts, the World Bank's OP 4.12 is triggered. If potential impacts are unknown prior to the detailed design of a project a RPF must be prepared by the client. If exact impacts are known prior to detailed design, a RP needs to be prepared. The RPF or RP need to be prepared in consultations with affected people.
- (d) *Indigenous Peoples OP4.10* – As described in section 2.23, each project will need to define whether there are indigenous people located in the project area. If indigenous people are found to be in the project area, an Indigenous People's Plan must be prepared

by the client as per World Bank policy OP 4.10. If indigenous people are potentially found in the project area, but it will be unclear until detailed design, an Indigenous People's Framework must be prepared. If the policy is triggered, free, prior and informed consultations that can lead to broad community support for the project will also be necessary.

C. Environmental and Social Management Requirements for the Program.

9. **Project stages.** The likely stages for each Project would include the following:

- (a) *Design stage.* Before laying of the cable begins, the project undergoes a four step design stage which includes: (i) initial route selection and project scope; (ii) environmental and social impact assessment, EMP, and RPF/RP and/or Indigenous People's Plan/Framework if applicable.
 - (i) Marine route survey – is conducted along the initial route selection using multi-beam bathymetric mapping controlled by satellite navigation.
 - (ii) Detailed Design – the information provided in the marine survey and the ESIA provides key input for the detailed design, the final cable route selection, surface laying or trenching and burial near coastline locations and supplementary protection requirements. If OP 4.12 on Involuntary Resettlement is triggered and only an RPF was prepared in stage 1-ii, then a RP needs to be prepared and implemented at this stage.
- (b) *Cable laying.* Notification and Commissioning Stage
- (c) *Operation stage.* The cable is designed to operate for 20 to 25 years. In the normal course of events, recovery of the cable should only be necessary in the event of damage to the cable from external sources. Recovery and repair or replacement of sections of the damaged cable generally involves: (i) location of the cable and if repair is required, identification of the damaged section, (ii) retrieval of the cable with specially designed grapnels deployed from the repair vessel, and (iii) lifting to the surface for removal or repair. Once repaired, the cable is returned to the seabed.

10. **Environmental and Social Impact Assessment Process for each Program Phase** (i.e., Phase 2, 3, 4, and 5) are as follows:

- (a) *Responsibility:* The entity operating the cable entity for each project, in each country (i.e., Samoa, Solomon Islands, Vanuatu, etc.).
- (b) *Expected start date:* Soon after initial route selection and project scope are agreed upon and will be completed as a condition of World Bank appraisal of that project, (i.e., APL Phase),
- (c) *Safeguards documents:* Environmental and Social Impact Assessment and corresponding EMP are mandatory. However, Resettlement Action Plans or RPF and Indigenous Peoples Plan or Indigenous Peoples Policy Framework may also be required.

- (d) *Broad scope:* The objectives of this work are thus to determine the full range of environmental and social impacts of each phase of the APL Program in order to inform the project design to either avoid these impacts altogether if possible, and if not to design and include during project implementation detailed tangible mitigation and monitoring measures to either reverse these impacts or to otherwise manage them to acceptable limits, thus complying with both the national requirements and World Bank policies.
- (e) *Environmental impact assessment tasks:* Key tasks will include determining the Projects/cables influence area, locating the marine protected areas that overlap or are adjacent to the marine influence area, obtain relevant baseline data in the influence area and adjacent areas and marine protected areas, examination of all applicable law and World Bank policies, analysis of direct, induced and cumulative impacts, analysis of alternatives, conduct of meaningful consultations, assess institutional capacity to manage these impacts and to prepare a detailed environmental management plan.
- (f) *Social impact assessment tasks:* Key tasks will include identifying the main stakeholders of the project; determining the extent (or potential extent) of project impacts to people's lands, assets, access to assets, structures, business or livelihoods in any way; assessing whether there are indigenous peoples in the project area; conducting ongoing consultations with stakeholders; conducting due diligence on any land being used for project purposes to verify land tenure arrangements; assessing institutional capacity to manage potential project impacts and to prepare Resettlement and/or Indigenous People's Plans/Frameworks as necessary.

11. **Approval process for ESIA and all safeguards documents.** With guidance from the World Bank task team, the Project/cable operating entity will prepare the terms of reference for the ESIA and all other safeguards documents as required. The World Bank task team will clear these terms of reference. The project/cable operating entity or their consultant will prepare the ESIA, EMP and all other required safeguards documents. The World Bank task team will review each draft and provide technical comments. The final draft ESIA and all safeguards documents will also be reviewed and approved by the national authorities in line with their legal requirements. The World Bank will also give its clearance of the ESIA, EMP and all safeguards documents. The World Bank's clearance of the ESIA and all safeguards documents, as well as their disclosure in locations and in a language accessible to project stakeholders, will be a condition for appraisal of that project/phase.

12. **Institutional arrangements.** At the project level (i.e., in each APL Phase), the key institutions involved will be as follows

- (a) *Cable operating entity:* as the countries in each phase (other than Phase 1) have not yet formalized their participation in the Program, it is not possible to list the names of the project implementing agency at this current time of preparing the ESMF. However, the responsibility for preparing and implementing the ESIA and corresponding EMP and all safeguards documents will be the cable operating entities in each participating country. Once the cable operating entity is known, the World Bank task team will assess their

capacity to implement the environmental and social management process and requirements described in this ESMF and if necessary, will agree on a set of capacity building measures including technical assistance that would be included in that particular Program phase

- (b) *National environmental agencies or ministries:* The responsibility for reviewing and approving the EISAs based on national laws and requirements will rest with these agencies.

13. **Public consultations and disclosure.** In compliance with OP4.01, and OP 4.12 if applicable, meaningful consultations must be carried out with the project's potentially affected peoples (in both countries where cable is connected from one country to another) and other stakeholders including national and international environmental nongovernmental organizations. These consultations must be carried out by the consultant preparing the ESIA, EMP and RPF/RP and/or IPP/IPF if applicable, but attended by the cable operating entity as well. It is recommended that a local, external facilitator be engaged for these consultations. The consultations will be documented by the facilitator and consultant undertaking the consultations. Recommendations for how the project design and implementation should address any issues raised during the consultations will be included in the final reports. The final approved reports (or their executive summaries) will be disclosed locally in the local language of those in the project area/potentially affected people and will also be disclosed at the World Bank's InfoShop. Public disclosure will be a condition for World Bank appraisal of the project. If OP 4.10 is triggered free, prior and informed consultations must be conducted that can lead to broad community support for the project. In all cases consultations should be an ongoing component of projects to ensure stakeholders are able to participate and comment in project design and implementation.

14. **Budget arrangements for safeguards management.** The financing for the costs of the mitigation measures in the ESIA, EMP and RPF/RP and all other safeguards documents, including any required capacity building measures, will be part of costs for each Program phase. The cable operating entity in each participating country will bear the cost of preparing the ESIA, EMP, and if necessary, RPF/RP and/or IPP/IPF and all other safeguards documents. Costs of consultations will also be borne by the project operating entity.

Annex 6-Appendix 1

Best Practice for Vessels Operating Near Cetaceans

Generic best practice guidelines for vessels operating acoustic apparatus within areas known to be frequented by cetaceans

Guidelines for all vessels

1. When piloting vessels, vessel operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
2. Reduce vessel speed to 10 knots or less when piloting vessels in the proximity of marine mammals.
3. Reduce vessel speed to five knots or less when piloting vessels in areas of known or suspected turtle activity.
4. Marine mammals and sea turtles should not be encircled or trapped between multiple vessels or between vessels and the shore.
5. If approached by a marine mammal or turtle, put the engine in neutral and allow the animal to pass.
6. Unless specifically covered under a separate permit that allows activity in proximity to protected species, all in water work will be postponed when whales are within 100 yards, or other protected species are within 50 yards.
7. Activity will commence only after the animal(s) depart the area.
8. Should protected species enter the area while in-water work is already in progress, the activity may continue only when that activity has no reasonable expectation to adversely affect the animal(s).

Guidelines for vessel operating acoustic apparatus

General requirements

1. The minimum source level required to achieve results should be used and frequencies chosen to minimize impacts on marine mammals.
2. Continuous noise is likely to be more damaging to marine mammals than pulsed sounds and should be avoided where possible.
3. Qualified and experienced marine mammal observers (MMOs) must be present on board all vessels conducting seismic (including boomers) or electromagnetic surveys at all times during the survey.
4. The MMO must use a distance measuring stick, reticle telescope or binoculars to ascertain distances to marine mammals.
5. MMOs must be engaged solely in monitoring the operator's implementation of these guidelines and conducting visual/acoustic observation of mammals during the survey.
6. The MMO must submit copies of the reporting template as outlined at the end of these guidelines and must submit this report to the competent government agencies the national country(ies).

6. The vessel operator must provide a report (including a daily log) on the operation of the seismic equipment that will indicate the soft starts and their duration to the MMO.

Multibeam and side-scan sonar surveys

Pre-start scan for marine mammals

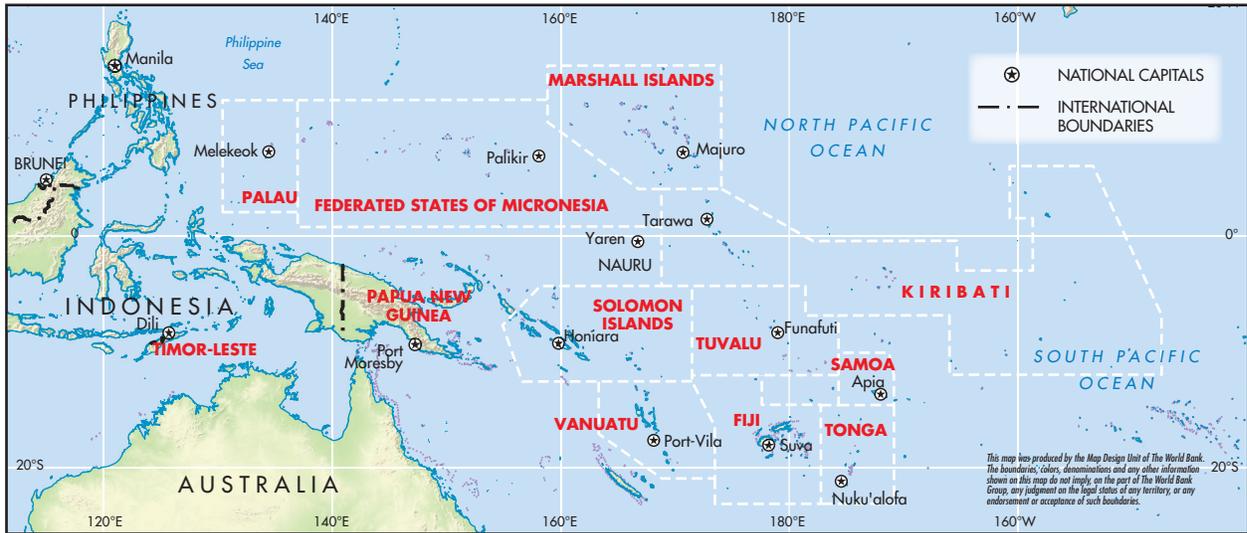
1. If survey work is to be conducted in sheltered and enclosed waters, survey work must start at the inner most part of the bay, inlet or estuary to be surveyed and work outwards. This is to ensure that cetaceans are not driven into an enclosed area which could cause them to panic.
2. MMOs should survey the area for the presence of cetaceans 30 minutes before the starting of operations.
3. A minimum distance of 1,000 meters is required between the centre of the array/sound source and the nearest cetacean before starting.
4. If marine mammals are seen within 1,000 meters of the centre of the sound source the start of the sound source(s) should be delayed until they have moved away, allowing adequate time after the last sighting for the animals to leave the area (30 minutes).
5. If the cetaceans do not leave the area it is recommended that the survey vessel alter course to ensure that the animals are outside the 1,000 meters exclusion zone when soft start commences.

Soft-start procedures for multibeam and side-scan sonar

1. The sound level must be allowed to gradually build over a period of 20 minutes; where this is not possible, the equipment should be turned on and off over a 20 minute period to act as a warning signal and allow cetaceans to move away from the sound source.
2. Multibeam or side-scan sonar start-up must occur during daylight hours when MMO's can carry out the required start-up procedure.
3. The start-up procedure should be implemented at all times including during testing of the sound source.
4. If, for any reason, the sound source is stopped and not restarted for at least five minutes a full start-up procedure should be carried out.
5. Once the sound source has achieved its maximum output the survey need not be halted if cetaceans approach the vessel.
6. If turn-around time between sample lines or stations is greater than the time required to conduct a start-up procedure (30 minutes), then the sound source should be stopped and a full start-up procedure should be used prior to commencing the new line.

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