

Document of
The World Bank

Report No: 00003971

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-48550 and IDA-448560)

ON AN

INTERNATIONAL DEVELOPMENT ASSOCIATION CREDIT (IDA-48550) IN THE
AMOUNT OF SDR 16.3 MILLION
(US\$ 25.6 MILLION)

INTERNATIONAL DEVELOPMENT ASSOCIATION CREDIT (IDA-44860) IN THE
AMOUNT OF SDR 19.8 MILLION
(US\$ 31 MILLION EQUIVALENT)

FOR THE FIRST PHASE OF THE WEST AFRICA REGIONAL
COMMUNICATIONS INFRASTRUCTURE PROGRAM (APL 1) IN A GLOBAL
AMOUNT EQUIVALENT TO US\$ 300 MILLION

December 30, 2017

Transport and ICT Global Practice
Africa Region

ABBREVIATIONS AND ACRONYMS

ACE	Africa Coast to Europe
AfT	<i>Agenda for Transformation</i>
AfDB	African Development Bank
APL	Adaptable Program Loan
C&MA	Construction and Maintenance Agreement
CAS	Country Assistance Strategy
CCL	Cable Consortium of Liberia
CDMA	Code Division Multiple Access
CPS	Country Partnership Strategy
EASSy	East African Submarine Cable System
ECOWAN	ECOWAS Wide Area Network
ECOWAS	Economic Community of West African States
ESMF	Environmental and Social Management Framework
ERR	Economic Rate of Return
FA	Financing Agreement
FM	Financial Management
FY	Fiscal Year
GDP	Gross Domestic Product
GNI	Gross National Income
GoL	Government of Liberia
GoSL	Government of Sierra Leone
GSM	Global System for Mobile Communications
ICR	Implementation Completion and Results Report
ICT	Information and Communication Technology
IDA	International Development Association
IDB	Islamic Development Bank
IEG	Independent Evaluation Group
IRR	Internal Rate of Return
ISP	Internet Service Provider
ISR	Implementation Status and Results Report
IXP	Internet Exchange Point
LTA	Liberia Telecommunications Authority
LTC	Liberia Telecommunications Corporation
M&E	Monitoring and Evaluation
MDAs	Ministries, Departments and Agencies
MDIC	Management Development International Company
MI	Medium Impact
MoIC	Ministry of Information and Communications
MoPT	Ministry of Posts and Telecommunications
MOU	Memorandum of Understanding
MTR	Mid Term Review
NPV	Net Present Value
OP	Operational Procedures
ORAF	Operational Risk Assessment Framework

NATCOM	National Telecommunications Commission
PAD	Project Appraisal Document
PDO	Project Development Objective
PFMU	Project Financial Management Unit
PIU	Project Implementation Unit
PPA	Project Preparation Advance
PPP	Public Private Partnership
QAG	Quality Assurance Group
RPF	Resettlement Policy Framework
SALCAB	Sierra Leone Cable Limited
SDR	Special Drawing Rights
SPV	Special Purpose Vehicle
TA	Technical Assistance
TTL	Task Team Leader
USAID	United States Agency for International Development
XDR	Special Drawing Rights
WAPP	West African Power Pool
WARCIP	West Africa Regional Communications Infrastructure Program

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CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2016 for Liberia)

Currency Unit = SDR
1.00 = US\$ 0.7164
US\$ 1.00 = 1.3958 SDR

FISCAL YEAR
January 1 – December 31

CURRENCY EQUIVALENTS

(Exchange Rate Effective June 30, 2017 for Sierra Leone)

Currency Unit = Sierra Leone Leone (SLL)
SLL1.00 = US\$ 0.0001346838
US\$ 1.00 = 0.72 SDR

FISCAL YEAR
January 1 – December 31

Liberia and Sierra Leone

West Africa Regional Communications Infrastructure Project (APL 1A – Liberia & Sierra Leone)

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A. BASIC INFORMATION

Country:	Western Africa	Project Name:	West Africa Regional Communications Infrastructure Program
Project ID:	P116273	L/C/TF Number(s):	IDA-48550,IDA-48560
ICR Date:	12/19/2017	ICR Type:	Core ICR
Financing Instrument:	APL	Borrower:	ECOWAS MEMBER COUNTRIES
Original Total Commitment:	XDR 36.10M	Disbursed Amount:	XDR 36.04M
Revised Amount:	XDR 36.05M		

Environmental Category: B**Implementing Agencies:**

Ministry of Information and Communications

Cofinanciers and Other External Partners:**B. KEY DATES**

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	06/08/2009	Effectiveness:	05/13/2011	04/29/2011
Appraisal:	11/22/2010	Restructuring(s):		09/30/2015 03/30/2016 01/30/2017 03/29/2017
Approval:	01/20/2011	Mid-term Review:	09/09/2013	12/16/2013
		Closing:	09/30/2015	06/30/2017

C. RATINGS SUMMARY**C.1 Performance Rating by ICR**

Outcomes:	Satisfactory
Risk to Development Outcome:	Substantial
Bank Performance:	Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory

Overall Bank Performance:	Satisfactory	Overall Borrower Performance:	Moderately Satisfactory
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C.3 Quality at Entry and Implementation Performance Indicators

Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Moderately Satisfactory		

D. SECTOR AND THEME CODES

	Original	Actual
Major Sector/Sector		
Information and Communications Technologies		
Telecommunications	50	50
Information technology	50	50
Major Theme/Theme/Sub Theme		
Private Sector Development		
Business Enabling Environment	40	40
Regulation and Competition Policy	40	40
ICT	20	20
ICT Solutions	20	20
Regional Integration	40	40

E. BANK STAFF

Positions	At ICR	At Approval
Regional Vice President:	Makhtar Diop	Makhtar Diop
Country Director:	Henry G. R. Kerali	Richard G. Scobey
Practice Manager:	Boutheina Guermazi	Philippe Dongier
Task Team Leader(s):	Zaid Safdar/Doyle Gallegos	Boutheina Guermazi/Mavis Ampah
ICR Team Leader:	Ida S Mboob/Adam Stone Diehl	

ICR Primary Author:	Ida S Mboob/ Adam Stone Diehl
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F. RESULTS FRAMEWORK ANALYSIS

Project Development Objectives (from Project Appraisal Document)

WARCIP seeks to increase the geographical reach of broadband networks and reducing the costs of communications services in West Africa. Under APL1-A, the objectives of the Projects, thus, are to increase the geographical reach of broadband networks and to reduce costs of communications services in the territory of Liberia and Sierra Leone.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Liberia- Volume of International traffic: International Communications (Internet, Telecoms and Data) bandwidth per person. Measured in Kbit/s per person			
Value quantitative or Qualitative)	1	40		35
Date achieved	01/01/2011	09/30/2015		09/30/2016
Comments (incl. % achievement)	Achieved 87% of target. Growth of international traffic has been robust with gains largely at the end of the project cycle(2015-2016). Nearly all traffic is transmitted through the project funded ACE cable landing.			
Indicator 2:	Liberia- Access to internet services (number of subscribers per 100 people). Measured in %			
Value quantitative or Qualitative)	1.5	3.0		30.8
Date achieved	01/01/2011	09/30/2015		09/30/2016
Comments (incl. % achievement)	Achieved 1953% of target. Introduction of 3G mobile internet service coupled with low prices provided an avenue for greatly expanded internet access in Liberia. Subscription rates reflect the number of active SIM cards with user enabled internet			
Indicator 3:	Liberia- Access to telephone services (fixed mainlines plus cellular phones per 100 people). Measured in %			
Value quantitative or Qualitative)	25	47		85
Date achieved	01/01/2011	09/30/2015		09/30/2016
Comments (incl. % achievement)	Achieved 265% of target. Access to telephone services increased dramatically with the arrival of the ACE cable, telecom competition lowered prices and drove network coverage increase.			

Indicator 4:	Liberia-Average monthly price of wholesale international E1 capacity link from the capital city to Europe. Measured in US\$ per 2 Mbps		
Value quantitative or Qualitative)	8000	2000	750
Date achieved	01/01/2011	09/30/2015	09/30/2016
Comments (incl. % achievement)	Achieved 121% of target. The cost of international connectivity dropped dramatically post ACE. The average cost of wholesale connectivity dropped by 90% during the project, far below the target value.		
Indicator 5:	Liberia- Direct Project Beneficiaries (of which female). Measured as the number of telecom subscribers.		
Value quantitative or Qualitative)	700,000 (45%)	1,400,000 (50%)	2,950,000 (39%)
Date achieved	01/01/2011	09/30/2015	09/30/2016
Comments (incl. % achievement)	Achieved 321% of target (78% of female beneficiaries target). Number of beneficiaries and females measured by survey of internet users. The share of females saw a decline from the baseline.		
Indicator 6:	Sierra Leone - Volume of international traffic: International Communications (Internet, Telecoms and Data) bandwidth per person. Measured in Kbit/s per person		
Value quantitative or Qualitative)	3	40	80.2
Date achieved	11/30/2010	12/31/2014	06/30/2017
Comments (incl. % achievement)	Achieved 209% of target. Increase in traffic is a direct result of WARCIP. ECOWAN project and expansion of national backbone enabled higher penetration of services.		
Indicator 7:	Sierra Leone -Access to internet services (number of subscribers per 100 people). Measured in %		
Value quantitative or Qualitative)	0.28	2	32
Date achieved	11/30/2010	12/31/2014	06/30/2017
Comments (incl. % achievement)	Achieved 1844% of target. Demand has increased as prices have dropped, coverage has increased and more 3G mobile services and applications have been launched.		
Indicator 8:	Sierra Leone -Access to telephone services (fixed mainlines plus cellular phones per 100 people). Measured in %		
Value quantitative or Qualitative)	25	43	80
Date achieved	11/30/2010	12/31/2014	06/30/2017
Comments (incl. % achievement)	Achieved 306% of target. The launch of ACE and increased competition has led to lower prices, higher network penetration and increased services.		

Indicator 9:	Sierra Leone -Average monthly price of wholesale international E1 capacity link from capital city to Europe. Measured in US\$ per 2 Mbps			
Value quantitative or Qualitative)	8000	2000		174.30
Date achieved	11/30/2010	12/31/2014		06/30/2017
Comments (incl. % achievement)	Achieved 130% of target. The cost of international connectivity dropped significantly once the cable was launched. SALCAB continues to lower wholesale prices by offering reduced to operators			
Indicator 10:	Sierra Leone -Direct Project Beneficiaries (of which female). Measured as the number of telecom subscribers			
Value quantitative or Qualitative)	2,000,000 (43%)	3,200,000 (48%)		3,600,000 (4
Date achieved	11/30/2010	12/31/2014		06/30/2017
Comments (incl. % achievement)	Achieved 112% of target. Interventions increased both male and female access to telecoms Such as free wifi services and the connectivity activity			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Liberia- Volume of available international capacity. International Communications (Internet, Telecom and Data) bandwidth. Measured in Gbit/s per second			
Value quantitative or Qualitative)	0.065	1.12		6.5
Date achieved	01/01/2011	09/30/2015		09/30/2016
Comments (incl. % achievement)	Achieved 607% of target. Available international capacity in Liberia increased during the project once ACE was launched and a capacity upgrade was completed.			
Indicator 2:	Liberia - Retail price of internet services (Mbit/s per month in US\$). Measured in US\$ per month.			
Value quantitative or Qualitative)	1200		500	400
Date achieved	01/01/2011		09/30/2015	09/30/2016
Comments (incl. % achievement)	Achieved 114% of target. Monthly internet access prices fell dramatically to \$400 per Mbit per second. This is below the target although still expensive for Liberia's income level.			
Indicator 3:	Liberia- Impact on Telecom sector of World Bank Technical Assistance (composite score). As measured on a scale from 1-5 by local telecom operators, where 1-low and 5-high impact			
Value quantitative or	0	4		3

Qualitative)				
Date achieved	01/01/2011	09/30/2015		09/30/2016
Comments (incl. % achievement)	Achieved 75% of target. As assessed by local telecom operators, the World Bank's technical assistance did not fully meet the sectors needs. It is not clear what criteria individual operators used to assess this indicator.			
Indicator 4:	Sierra Leone -Volume of available international capacity. International Communications (Internet, Telecom and Data) bandwidth. Measured in Gbit/s per second			
Value quantitative or Qualitative)	0.04	6		80.445
Date achieved	11/30/2010	12/31/2014		06/30/2017
Comments (incl. % achievement)	Achieved 1349 % of target. Available international capacity increased substantially due to ACE and big spike between 2015 and 2016 was as a result of ACE capacity upgrade			
Indicator 5:	Sierra Leone -Retail price of internet services (Mbit/s per month in US\$). Measured in US\$ per month.			
Value quantitative or Qualitative)	1500	800		180
Date achieved	11/30/2010	12/31/2014		06/30/2017
Comments (incl. % achievement)	Achieved 189 % of target. Once wholesale prices dropped, retail prices also dropped. Although much lower, it is still not affordable to the average Sierra Leonean			
Indicator 6:	Sierra Leone -Impact on Telecom sector of World Bank Technical Assistance (composite score). As measured on a scale from 1-5 by local telecom operators, where 1-low and 5-high impact			
Value quantitative or Qualitative)	0	3		5
Date achieved	11/30/2010	12/31/2014		06/30/2017
Comments (incl. % achievement)	Achieved 166% of target. The high score is as a result of the availability of bandwidth which enabled usage of applications such as facebook and WhatsApp in extended geographical areas.			

G. RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	09/21/2011	Satisfactory	Satisfactory	29.82
2	05/24/2012	Moderately Satisfactory	Moderately Satisfactory	46.50
3	12/12/2012	Moderately Satisfactory	Satisfactory	47.99
4	06/01/2013	Satisfactory	Satisfactory	50.27
5	02/22/2014	Moderately Satisfactory	Moderately Satisfactory	51.75
6	11/04/2014	Moderately Satisfactory	Moderately Satisfactory	52.51

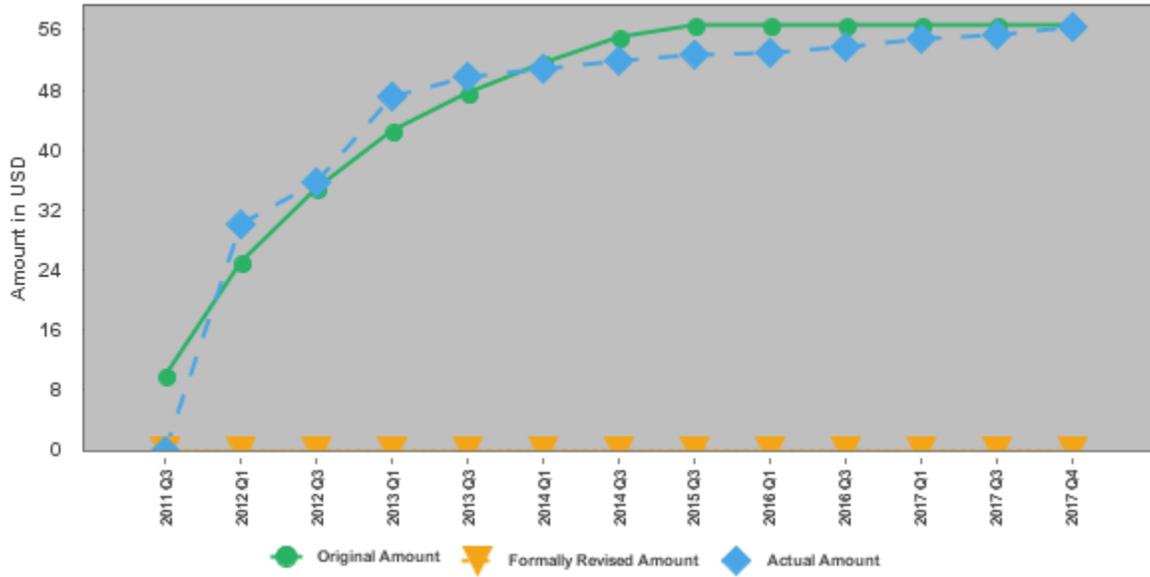
7	06/09/2015	Moderately Satisfactory	Moderately Satisfactory	52.87
8	06/09/2016	Moderately Satisfactory	Moderately Satisfactory	53.77
9	09/30/2016	Moderately Satisfactory	Moderately Satisfactory	54.90
10	03/20/2017	Moderately Satisfactory	Moderately Satisfactory	55.15
11	03/30/2017	Moderately Satisfactory	Moderately Satisfactory	55.37
12	06/28/2017	Moderately Satisfactory	Moderately Satisfactory	56.33

H. RESTRUCTURING (IF ANY)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD Millions	Reason for Restructuring & Key Changes Made
		DO	IP		
09/30/2015		MS	MS	52.97	Liberia- Level II restructuring for one year project extension to cater for delays caused by Ebola virus Sierra Leone - project closing date was extended for 6 months.
03/30/2016		MS	MS	53.67	Liberia- Level II restructuring to reallocate proceeds among categories of expenditure Sierra Leone - project date was extended for one year
01/30/2017		MS	MS	55.09	Sierra Leone - Level II restructuring to reallocate proceeds between categories to correct overdrawn balances of project categories, make unutilized refinanced PPF funds under category 3&4 and pay the consortium fees.
03/29/2017		MS	MS	55.37	Sierra Leone- Level II restructuring to extend project closing date for 3

months.

I. DISBURSEMENT PROFILE



1. Context at Appraisal

Background of WARCIP

1. The West African Regional Communications Infrastructure Program (WARCIP) supported select countries in West Africa to improve access to broadband connectivity at better quality and lower costs. The first phase of the project covering Liberia and Sierra Leone focused on improving access to international connectivity through the Africa Coast to Europe (ACE) submarine cable.¹ WARCIP was designed as a comprehensive solution to address international, national and regional connectivity gaps in the ECOWAS region to support countries to provide accessible and affordable broadband to their citizens. The first phase of the program financed participating Government's membership fees in ACE under open access principles and within a Public Private Partnership structure.

2. WARCIP was implemented as a series of Regional Adaptable Loans (APLs) addressing the connectivity needs of participating countries depending on their connectivity status and geographical location. The first phase of the program targeted small, post conflict, fragile and coastal countries that had been previously unable to connect to private submarine cable consortia such as Main one or South Atlantic 3/West Africa Submarine Cable (SAT3) because they were not considered economically viable or stable. As such, their only option was to depend on costly satellite technologies for international communications. The outcome was limited, expensive and unreliable broadband services which hampered economic and economic development.

3. WARCIP was expected to develop a West African telecommunications network focusing on improving international connectivity to the unconnected coastal countries, improving connectivity to landlocked countries and considering approaches for redundancy through leveraging power transmission lines.

4. The economies of scale a regional market generates buttressed the argument for regional integration. Submarine and terrestrial fiber infrastructure require very high up-front capital costs that small, post conflict countries simply cannot individually afford. Infrastructure investments across the sub region creates an economically viable opportunity as market access expands and bandwidth capacity can be scaled up at minimal cost. Telecoms sectors at infancy stage are then able to benefit from reduced bandwidth cost, increased penetration rates, wider access to consumers across countries and continued investment whilst simultaneously maintaining cost effectiveness. These public policy considerations justified the Bank's intervention through WARCIP.

Context at Appraisal and Sector Context

¹ The ACE cable was initiated by Orange and administered by a consortium of operators. Its roll-out was divided into two phases, with phase 1 comprising of 3 segments (France-Senegal, Senegal-Côte d'Ivoire, Côte d'Ivoire-São Tomé and Príncipe) and phase 2 extending the cable from São Tomé and Príncipe to South Africa. The WARCIP program has expanded to include, Sierra Leone, Liberia, Mauritania, Togo, Benin, Burkina Faso, The Gambia, and Guinea, with additional countries under discussion.

5. WARCIP APL1-A built on the World Bank's history of strong engagement in Liberia and Sierra Leone's telecommunications sectors. Following the cessation of violence and return to democratic rule in both countries, Information Communications Technology (ICT) was identified as an area of priority to rebuild their economies and promote peace and social cohesion. Through Technical Assistance and Trust Fund resources, the World Bank supported both countries to establish independent ICT regulators, create legal and regulatory frameworks and build their telecom sectors, prior to WARCIP APL1-A.

6. The challenges associated with this project were very high and the results uncertain. The project was expected to build international infrastructure whilst simultaneously implementing difficult policy and operation reforms in two countries where capacity was limited and the governance systems weak. The proposed Public Private Partnership (PPP) structures had never been implemented in these ICT sectors so PPP management was inexistent. Yet, the magnitude of these risks were overshadowed by the adverse impact that maintaining the status quo would have on both countries where telecommunications infrastructures was destroyed during their civil wars and investments to rebuild them were not forthcoming. Neither country could connect to the global broadband optical fiber network so they relied on expensive satellite connectivity. This rendered basic internet unaffordable for citizens at \$5000 for 1Mbps. WARCIP APL1-A provided both countries with the chance to stimulate economic growth, enhance trade, improve public service delivery and promote peace and social cohesion.

Liberia

7. Liberia's economy, institutions and population of less than 4 million were devastated by the country's 14-year civil war, which ended in 2003. After the war, Liberia successfully transitioned to a peaceful, democratic state. Yet, as of 2010, Liberia remained the second poorest country in the world, with a gross national income per capita of US\$150. While Liberia had seen relatively high rates of Gross Domestic Product (GDP) growth prior to the global financial crisis, an estimated 63.8 percent of the population (more than one and a half million Liberians) lived below the national poverty line, with 47.9 percent living in extreme poverty. Many working age persons remained unemployed or underemployed.

8. Liberia's nascent telecommunications sector was very weak, as of 2010. Earlier reforms increased private sector participation by licensing 4 private Global System for Mobile Communications (GSM) operators leading to an increase in penetration of 22% in 2010 from 0.06% in 2003. While mobile telephone networks were expanding, high data costs and the lack of a national backbone network led to great difficulty in expanding the availability of internet services. Internet penetration in 2010 was not only among the lowest in Africa, at 0.5% of the population but the price was typically 2 to 3 times more than the regional average.

Sierra Leone

9. Sierra Leone's social, economic and physical infrastructures were damaged by a civil war which lasted from 1991-2002 with over 50,000 lives were lost. Sierra Leone was classified as post conflict and fragile, up to 15 years after the war ended despite peacefully transitioning into a democratic state and rebuilding their economy. Impressive economic growth peaked at 27% in 2002 and eventually slowing down to 4% in 2009. Their GDP per capita increased from \$206 in 2002 to \$352 in 2009 yet they were classified as one of the poorest countries in the world.

10. Telecommunications sector reforms from 2003 increased competition with the licensing of 5 GSM operators and 1 fixed line and Code Division Multiple Access (CDMA) operator. Nonetheless, Sierra Leone's telecommunications was characterized by weak infrastructure, absent national back bone, poor internet penetration rates and a monopoly over the international voice and internet gateway. Only 0.03% of the population subscribed to the internet and less than 1000 people subscribed to broadband services. The mobile voice market registered growth as penetration rates increased from 0.28% in 2000 to 27% in 2010.

Higher Level Objectives

11. The project's primary higher level objective was to create a regionally integrated market. Through the provision of high speed connectivity in Liberia and Sierra Leone, the project was expected to lower costs for users, expand mobile coverage and provide higher quality internet services. By gaining access to international cables, Liberia and Sierra Leone were expected to have better and cheaper access to communications and connect more effectively with the rest of the world. Studies suggest that a 10 percent increase in broadband penetration in developing countries equates to a 1.4 percent increase in GDP per capita.² In addition, the expansion of broadband networks stimulates investment, economic growth, and social development. Internet connectivity has been an effective tool for post-conflict stabilization, emergency response, and economic recovery. ICT provides a key platform for restoring peace and security, and strengthening social cohesion in war-torn countries. In times of emergency, mobile connectivity to a large share of the population can greatly facilitate effective response.

1.2 Original Project Development Objectives (PDO) and Key Indicators (*as approved*)

12. The project development objective (PDO) of WARCIP APL1-A is to increase the geographical reach of broadband networks and reduce the costs of communications in Liberia and Sierra Leone.³

13. To achieve this objective, the project fostered open and cost-effective access to communications infrastructure. The cost of communications is a function of the wholesale costs paid by operators and market competition, which encourages price savings to be passed on to the customer. The telecom markets in both countries has been competitive, with multiple operators including international telecoms companies providing coverage in many areas except international connectivity in Sierra Leone.

² See, for instance: Qiang, Christine Zhen-Wei, Carlo M. Rossoto, and Kaoru Kimura. 2009. "Economic Impacts of Broadband." In *Information and Communications for Development 2009: Extending Reach and Increasing Impact*, chap. 3. World Bank.

³ All other countries covered by the WARCIP APL use the same PDO.

14. The geographic reach of the broadband network is measured by proxy as the share of the population with access to internet and telephone services, as well as the total number of users and volume of traffic per population. Share of the country reached (by land area, for instance) is not available. The price of communications is measured directly, by the average wholesale cost and the average retail price of internet services.⁴

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

15. The PDO was not revised and remained relevant throughout the project's duration.

1.4 Main Beneficiaries

16. The project's beneficiaries included internet users, active mobile users, telecommunications operators and users, universities, schools, hospitals, Banks, corporations and ministries, and departments. By improving the reach of broadband networks and lowering the costs of connectivity, the project intended to help people across Liberia and Sierra Leone to communicate, share information, improve productivity and service delivery, find better prices, improve access to markets, and increase their bargaining power.

1.5 Original Components (as approved)

17. WARCIP APL1-A had three components: to cover international connectivity to ACE Submarine cable through membership fee, to develop the enabling environment within the country, and to support project implementation. GoL and GoSL's participation in ACE were financed under open access principles and within a PPP structure.⁵ WARCIP APL1-A financed Government's membership fees which included a share of ownership in the ACE cable and access rights to the submarine cable capacity

18. Private sector participation was critical to the sustainability of the project and they were engaged from project conception to mitigate the risk of their disinterest.

Liberia

19. Component 1, supporting connectivity, carried the bulk of the project's financing (US\$21 million) and provided the primary vehicle for achieving the PDO. Sub component 1a, international connectivity, covered the government's participation in ACE. Private GSM operators (Lonestar and Cellcom) already contributed US\$5 million to Liberia's ACE membership, prior to project approval. Sub component 1b, regional connectivity, (established a Universal Access Fund and IDA resources provided seed capital to launch the fund.

20. Component 2, Enabling Environment, (US\$3.3 million) supported strengthening of the enabling environment for connectivity. Sub component 2a, PPP framework, created the PPP

⁴ Please see data sheet for indicator details.

⁵ Open Access is defined as an equal opportunity for all operators to access available infrastructure under similar terms and condition

framework for a special purpose vehicle (SPV) to own and operate the ACE cable landing station and guidance for the ultimate divestiture of government shares in the SPV. Sub component 2b, policy and regulatory environment, focused on addressing policy and regulatory bottlenecks at the national level, including legal and regulatory support for improved connectivity, formulation of the Universal Access Fund, and support for repositioning of the national incumbent operator, Liberia Telecommunications Corporation (LTC), in the market. Sub component 2c, institutional capacity strengthening, provided capacity building for the Ministry of Posts and Telecommunications (MoPT) and the national regulator, Liberia Telecommunications Authority (LTA). These sub-components were designed to ensure that the project's PPP agreements and principles were implemented effectively.

21. Component 3, Project Implementation, (US\$1.3 million) provided project implementation support. It established a Project Implementation Unit (PIU) and built the capacity of the implementing agency, LTA to deliver the rest of the project

Sierra Leone

22. Component 1, Supporting Connectivity, (US\$26.75 million) provided the primary vehicle for achieving the PDO. Sub component 1a, international connectivity, (US\$ 25 million) covered the government's participation in ACE. Sub component 1b, national connectivity, (US\$1.75million) developed national connectivity by investing in national infrastructure for critical services. This included: i) a high-speed government virtual private network of selected priority Ministries, Departments and Agencies (MDAs) within Freetown, ii) a national emergency communications network, and iii) support for the national Internet Exchange Point (IXP). IDA resources were complemented under sub component 1b by the Islamic Development Bank (IDB) funded 660km terrestrial fiber optic ECOWAS Regional Backbone and e-Governance Program (ECOWAN) Sierra Leone Project. ECOWAN financing was separate from WARCIP APL1-A.

23. Component 2, enabling environment, (US\$2.93 million) strengthened the enabling environment. Activities included a) developing a legal and financial framework for the PPP b) preparing the divestiture strategy for SALCAB, c) strengthening policy and regulatory capacity e) supporting the privatization of SierraTel, and f) supporting the management for liberalization of the international gateway.

24. Component 3, project implementation, (US\$1.32 million) supported project implementation by establishing the Project Implementation Unit (PIU) at the Ministry of Information and Communications (MoIC).

21. See Annex 3 and Annex 4 for more detailed discussions of both project components.

1.6 Revised Components

25. Sub component 1b and Component 2 were revised for WARCIP Sierra Leone through a level II restructuring. The establishment of an Internet Exchange Point (IXP) and the creation of

a national emergency communications network in sub component 1b, were both cancelled since they were progressing slowly and the funds allocated to them were not significant enough to have material impact. The funds for the cancelled activities were reallocated to the connectivity activity in sub component 1b which was expanded to include more institutions and implemented as a priority. The privatization of Sierratel under component 2 was also cancelled as the GoSL entered into a \$6 million, 3-year contract in March 2012 with Management Development International Company (MDIC) to manage Sierratel. The Bank also considered that the Parliament had approved the privatization of Sierratel in September 2012, which aligned to the project's objectives. These funds were reallocated to support SALCAB under Component 2.

1.7 Other significant changes

26. In March 2014, the GoSL's rights to make further withdrawals from the WARCIP APL1-A Credit was suspended for 18 months. The project suspension was triggered by GoSL's failure to divest Government shares in SALCAB in violation of the legal covenants and general conditions in the Financing Agreement (FA). The severity of the continued noncompliance increased the risk to the PDOs and prompted the commencement of the project cancellation process. The Bank however decided on humanitarian grounds to stop the cancellation process because the GoSL was battling the Ebola crisis which hit them shortly after the suspension. The Ebola crisis also struck Liberia within the same period and the project suffered delays as national priorities shifted to manage and reverse the health epidemic's severe economic and social impact. Once the Ebola crisis subsided and the project suspension in Sierra Leone was lifted there was justification for project extensions to allow sufficient time for the PDOs to be achieved. These extensions were granted through project restructurings which also reallocated proceeds between categories.

Liberia

27. Two restructurings were approved for the project. The first, a Level 2 restructuring, was approved on September 30th, 2015 by the Country Director to respond to the Ebola outbreak. It extended the project closing date by one year (from September 30th, 2015 to September 30th, 2016) to allow for additional implementation time to address delays caused by the crisis and reallocate project proceeds between categories. A second Level 2 restructuring, approved by the Country Director on March 30th, 2016, reallocated proceeds among categories of expenditures.

Sierra Leone

28. Four level II restructurings were approved by the Country Director for the project. The first restructuring approved on September 30th 2015, extended the project closing date from September 30th 2015 to March 30th 2016. The second restructuring, approved on March 30th 2016 extended the project closing date from March 30th 2016 to March 30th 2017. The third restructuring approved on January 30th 2017 reallocated proceeds to correct over drawn balances of the project categories, revised components, made unutilized refinanced PPF funds under category 3 & 4 (Q718 & 724) and pay the consortium fees. The fourth and final restructuring approved on March 29th 2017, extended the project closing date from March 30th 2017 to June 30th 2017 to allow sufficient time for the connectivity activity to be completed.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

29. Project Preparation, Design and Quality at Entry featured comprehensive analysis, rapid mobilization of resources, extensive consultation and the introduction of new design concepts. Project preparation was completed in record time as the Bank team committed to both countries connecting to ACE within the extremely tight timelines. Resource mobilization required waivers to increase the ceiling for PPA resources to make a first installment to ACE membership payments due before project effectiveness. The proposed PPP approach had never been implemented within the Bank or with either country and extensive consultation was required both internally and externally. The project was also the first example of funding submarine cable participation and required detailed discussion with submarine cable consortium and collaboration between the public and private sectors. The project team provided hands on technical assistance which was critical to establishing the SPVs and persuading the private sector operators to contribute to the ACE payments within a short period of time. Despite working under this intense pressure, the project preparation and design were thorough and of high quality.

30. As Liberia and Sierra Leone were the first countries to participate in the WARCIP program, the project team drew lessons from similar regional ICT programs across Africa. These included the Central African Backbone-APL1-A (P108368), the Regional Communications Infrastructure Project (P094103), and the East African Submarine Cable System (EASSy). The project design also factored Independent Evaluation Group's (IEG) assessments of previous regional projects which recommended better integration with national country assistance programs, strong country commitment to regional cooperation, strong correlation between scope of project and national and regional capacities, clear delineation, and coordination of roles for national and regional institutions. As such, the design included coordination with relevant bodies such the Economic Community of West African States (ECOWAS), the West African Power Pool (WAPP), the African Development Bank (AfDB), IEG and the Quality Assurance Group (QAG). WARCIP Sierra Leone, also considered the parallel financed ECOWAN project which was designed to develop national infrastructure in Sierra Leone.

31. The project team considered country context and conducted due diligence during the speedy project preparation. They developed an innovative, flexible design that could adapt to the evolving needs of these post conflict, fragile and small countries. The PPP was designed as a cooperative enterprise that would leverage private sector participation to promote efficiency and sustainability in view of both countries histories of poorly managing state owned telecoms projects. Senior management were involved in all consultations. Experts supported both countries, during project preparation, to comply with requisite policies including safeguards and PPP management to prevent delays during implementation. The adaptable nature of the project design served its purpose in Liberia during the Ebola crisis and Sierra Leone during project suspension.

32. As indicated above, WARCIP APL1-A was developed under a very tight timetable. Both countries signed a Construction and Maintenance Agreement (C&MA) on June 5th, 2010 to

participate in ACE.⁶ By signing the C&MA, GoL and GoSL committed to compliance with a very tight set of payment installment deadlines, the first of which was due on July 23rd, 2010. A set of complex negotiations were required amongst the various stakeholders in both countries as well as between Liberia and Sierra Leone and the ACE consortium.

33. Two separate Project Preparation Advances (PPA) were approved for the project to support project preparation and to make installment payments which were due to ACE before project effectiveness. The initial PPA of US\$ 3.0 million was approved on April 1 2010 and each country was allocated \$1.5 million. This PPA supported the creation of Cable Consortium of Liberia (CCL) in Liberia and the development of the divestiture framework for Sierra Leone Cable Limited (SALCAB) in Sierra Leone. It was also used for environmental and social safeguard implementation, the creation of a legal and regulatory open access environment, and the establishment of both PIUs.

34. The second PPA of \$10 million was approved on June 3rd 2010 and each country was allocated \$5 million. This PPA provided the initial installment payment which was due to ACE before project effectiveness. Because this PPA surpassed the World Bank's \$3 million threshold for non-emergency projects, at the time (as set out in OP 8.10) a waiver was required from the Managing Director.⁷ The \$ 5 million payment for each country was made to ACE under direct disbursement. GoL and GoSL both contributed additional amounts of US\$ 1.0 million and US \$ 2.5 million respectively to ACE in anticipation of reimbursement after project effectiveness.

35. Project appraisal for both countries took place in November 2010 and Board approval was granted in January 2011. Key areas of negotiation for Liberia included the design and creation of CCL,⁸ legal and regulatory studies, institutional arrangements, financial management and procurement, and safeguards adequate for deep sea cable infrastructure. Key areas of negotiation for Sierra Leone included the agreement that the GoSL would liberalize the international and internet gateway, SALCAB would dispose of at least 50% of its shares to the private sector and part or all of the proceeds from the divestiture would be used to further develop national and cross border connectivity gaps in their territory. It was agreed by both parties that private sector participation was critical to the success of the project. The GoSL also agreed to complete all legally mandated activities within the required period.

36. Based on the Operational Risk Assessment Framework (ORAF) analysis, the overall risk at preparation and implementation was rated as Medium Impact (MI),⁹ due largely to country and institutional contexts outside of the scope of the project. In terms of the actual construction of the cable and landing station, most of the technical details of the ACE cable were covered by the consortium.

⁶ The Construction and Maintenance Agreement was signed by CCL on Liberia's and SALCAB on Sierra Leone's behalf on June 5th, 2010 respectively.

⁷ São Tomé and Príncipe, through the Central African Backbone Program, were also working to join the ACE cable, and received similar waivers.

⁸ CCL was established utilizing a "pass-through" model, whereby owners receive a share of the available capacity for their investment. CCL generates little revenue on its own (see Annex 3 for annual revenue and cost data on CCL). Securing buy in for this structure was facilitated by private and public sector stakeholders' recognition that Liberia is a relatively small, fragile market, and that collaboration was likely necessary to achieving connectivity.

⁹ Risk Based Assessment

Liberia

37. In addition to the reforms mentioned in paragraph 8, Liberia had to address a number of factors in their telecommunications sector, to participate in the ACE cable. In order to join ACE, the GoL and its private sector partners, facilitated by the World Bank, had to conduct a set of complex negotiations. Two private operators contributed to Liberia's first ACE membership installment (a total of US\$5 million).

38. The selection of the LTA as the implementing agency, and host to the project implementation unit (PIU), was based on the predominantly regulatory nature of the project and the agency's technical and project management experience. The MoPT was associated with the project through a steering committee, as a beneficiary of capacity building and as lead agency to coordinate e-government in Liberia. The PIU was established to manage the day-to-day activities of the project. Financial management functions were conducted by the Project Financial Management Unit (PFMU) within the Ministry of Finance which handles financial management for all Bank projects in Liberia, and has a strong track record of good performance.

Sierra Leone

39. WARCIP Sierra Leone centered heavily on difficult policy and operational reforms and needed strong country commitment and ownership. To nurture this, the project design was aligned with Sierra Leone's National ICT Policy principles of open access, competition and liberalization. This cohesion garnered strong country commitment as the President of GoSL established and chaired the national ICT council. The Bank identified key areas of risks including the design of the PPP, inadequate financing, poor implementation, failed divestiture, lack of collaboration and weak procurement capacity. They proposed measures to mitigate these risks including mandating key activities which affected the PDOs through disbursement conditions, general conditions, and legal obligations. The Bank also recruited experts in areas such as submarine cables, PPPs, legal and regulatory reform to support the GoSL prepare for this project, given their institutional weaknesses identified during project preparation.

34. The MoIC was selected as the implementing agency and host to the PIU because they were responsible for setting national ICT policy and would implement the national connectivity activity. The PIU were responsible for financial management, procurement, and monitoring and evaluation (M&E). The Office of the Chief of Staff at the Office of the President had oversight of the project and was responsible for coordinating the different Government stakeholders.

The Project Quality of Entry is rated as Satisfactory.

2.2 Implementation

35. WARCIP APL1-A became effective in Sierra Leone on April 29th 2011 and in Liberia on June 12th 2011. Project implementation was plagued with varying degrees of challenges, some of which were beyond the control of the beneficiaries. The catastrophic Ebola epidemic shifted national priorities and the project suspension in Sierra Leone resulted in delays during implementation.

36. The overall WARCIP APL1-A disbursement rate for both countries at project closing was 100%. The majority of planned activities were completed and most of the indicators in the results framework were achieved and/or surpassed. The overall implementation was rated moderately satisfactory and progress towards the Development Objectives rated satisfactory at project closing.

Liberia

37. Implementation of the project in Liberia proceeded smoothly with the exception of delays during Ebola. Subcomponent 1a, international connectivity, was completed soon after the project became effective. This included disbursements to ACE and commencement of construction of the landing station in Monrovia. This sub-component, representing 78% of the project's financing, was rapidly implemented. CCL was already under operation at project approval so many of the hurdles to the ACE landing had been already addressed. Finally, as discussed in section 2.1, the technical aspects of the ACE cable and construction of the landing station in Liberia were handled by the ACE private sector consortium and its supplier, Alcatel-Lucent. The official landing of the cable in Liberia took place in November 2011. By the time the cable became operational, on January 18th, 2013, all payments to the ACE consortium had been made. Implementation of the cable landing and construction of the landing station proceeded generally according to schedule.



Figure 1: ACE Cable Landing



Figure 2: ACE Landing Station

38. The second half of component 1, establishment of the Universal Access Fund (UAF), was revised throughout the project. The financing agreement required the preparation of regulations and an operating manual for the operation of a fund before disbursements could be made and this condition was met. LTA however agreed with the project team to implement the planned universal service activities as the PIU and not as fund managers in order to expedite the deployment of universal service deliverables. The unexpected delays from Ebola, delayed the commencement of this process so by project closure, the LTA opted to revert back to the original design since they had already met the disbursement condition. The deposit for the UAF was approved by the project team just before project closure.

39. The enabling environment component focused on three primary areas: a) development of CCL, b) addressing policy and regulatory bottlenecks, and c) building the capacity of the sector. The CCL was created prior to project approval, with funds from the first PPA. These funds supported CCL's design, negotiations among stakeholders, and the drafting of transaction documents. CCL was established as a SPV to own and manage the ACE cable landing station under open access principles. It was established as a PPP, where the GoL owned a 60% share, LTC a 20% share, and private service operators 20% (Lonestar/MTN and Cellcom with 10% each). During implementation, a third private operator, Novafone, acquired 5% of CCL from the government. Under the second sub-component a number of studies were conducted to streamline and facilitate the growth of the sector. While some activities were delayed by the Ebola crisis and other reasons, all activities under this component were completed by project closure to the

satisfaction of the recipients and the World Bank. Capacity building was provided to the MoPT and LTA on a range of topics, including study tours, in-country workshops, and hands-on trainings.¹⁰

40. During the Mid Term Review (MTR), conducted in December 2013, the project's implementation was rated as satisfactory and was expected to achieve the PDO. Overall, disbursement had reached 88%, the ACE cable was operational, and CCL had been established. Discussions during the MTR focused on ensuring CCL's continued and long term viability, reallocation of Universal Access funds into projects and progress of pending studies under component 2. A revised approach to establish an eGovernment office in the MoPT was also discussed including plans to purchase a demultiplexer to install in CCL and provide smaller units of capacity to a wider range of retailers. By MTR, two PDO indicators had already achieved their targets, and the other indicators were expected to do the same by project closure.

41. As many of the more difficult issues, such as the design and establishment of CCL, had been addressed during project preparation, implementation generally proceeded smoothly. The Ebola outbreak caused implementation delays, requiring an extended closing date to allow all activities to be successfully completed.

Sierra Leone

42. The implementation of WARCIP APL1-A Sierra Leone was inconsistent. The GoSL initially committed to implement all activities. However, once implementation was underway they breached their legal obligations by failing to implement key activities mandated by the FA. The Bank made concerted efforts to address these issues to no avail.¹¹ Eventually, GoSL's rights to make further withdrawals from the credit from March 4 2014 to October 1 2015.¹² The Bank continued to engage the GoSL during the suspension period to encourage compliance with the FA. The GoSL implemented some very difficult policy reforms during and after project suspension with the exception of the divestiture of their shares in SALCAB, which posed the greatest risk to sustainability.

43. Sub component 1a, funded Sierra Leone's contribution to the ACE consortium and represented 76% of project funds. Sierra Leone's portion of the ACE cable was only activated on February 23 2013 after they paid their arrears to ACE. The publication and broadcasting of GoSL's action plan for the liberalization of the international telecommunications and internet gateway was completed January 9th 2012.¹³ The amendment to the Telecommunications Act to reverse the monopoly of Sierratel over the GoSL's international telecommunications and internet

¹⁰ See Annex 3 for a summary of outputs by component

¹¹ Letters were written to the Minister of Finance and Economic Development on July 13 2012, April 16 2013, October 18 2013 and November 5 2013. The issues were also discussed on a mission to Freetown from September 24-27 2013 led by two IDA directors, Yusupha Crookes and Jamal Saghir, and during meetings with the GoSL in Washington DC from October 8-10 2013. On December 27 2013 the Bank warned GoSL of suspension if the breaches were not cured by January 31 2014 and as the breach continued past this date, the project was suspended.

¹² Pursuant to section 6.02(b) (i) and section 6.02 (m) of the General Conditions and Article IV, Section 4.01(a) and provisions of Section I and IV of schedule 2 to the Financing Agreement

¹³ Section I.G.2(a) Schedule 2, Financing Agreement. This was a legal covenant which should have been completed on September 30 2011

gateway was completed on March 26th 2015 during project suspension.¹⁴ Six operators were granted international telecommunications and internet gateway licenses in February 2016 for a \$150,000 license fee. Implementation of subcomponent 1b, national connectivity was delayed until February 2013 to allow the PIU to focus on subcomponent 1a. Two activities in this subcomponent related to the establishment of the IXP and the creation of a national emergency communications network were cancelled. The connectivity activity was expanded from 10 Government offices to include 10 schools and 10 universities.

44. Component 2 supported the development of an enabling environment. A disbursement condition required the GoSL to offer its shares in SALCAB for sale in an amount and manner satisfactory to the Bank before a final \$1.25 million payment would be made to ACE.¹⁵ The Bank and the GoSL agreed that a minimum of 50% of shares would be offered. This condition was met on October 5 2012 when the GoSL signed a Memorandum of Understanding (MOU) with 9 operators including GSMs and Internet Service Providers (ISPs). The operators, Airtel, Africell, Comium, AFcom, Online, IPTel, Nextgen, Sierratel, and Teltac each acquired 6.5% of ownership in SALCAB, totaling 58.5%. They also signed shareholder agreements on December 11 2012 which became effective on January 9 2013. The Bank also required GoSL to legally separate the ECOWAN project from SALCAB by April 9 2013 to separate any financial obligations beyond ACE.

45. By actions taken within 7 months of divestiture on July 18th 2013, September 3rd 2013 and November 26 2013, the GoSL effectively terminated the divestiture agreement violating conditions of the FA.¹⁶ These included the unilateral removal of the SALCAB Board chairman, the appointment of a new Managing Director of SALCAB, the termination of the divestiture agreement and the requirement that private sector operators purchase whole sale capacity from SALCAB at uncompetitive rates. According to SALCAB, the private operators defaulted on contractual payments, mismanaged the landing facilities and failed to substantially reduce retail prices even though wholesale prices had dropped.¹⁷ Conflict between the two parties escalated, resulting in some operator's access to the landing station being temporarily restricted. By January 2014, two months before suspension, the GoSL assumed full control of SALCAB. GoSL temporarily reverted to the shareholder's agreement during project suspension but eventually reversed this decision. Currently, SALCAB operates and identifies as 100% Government owned.¹⁸ At project closing, only Africell, Onlime, and Airtel remained shareholders of SALCAB as the others relinquished their shares. The remaining shareholders do not exercise any control over SALCAB and are required to purchase whole sale capacity as customers.

46. Component 2 also supported regulatory and policy reforms to support liberalization including legal advisory services to finalize the telecommunications law to reverse the Monopoly on the international telecommunications gateway. This was the only activity that was allowed to

¹⁴ This activity should have been completed on January 23 2012

¹⁵ Minutes of negotiations, paragraph 2, November 30 2011. This requirement was also intended to address the general poor track record of Government management of communications infrastructure/services in Sierra Leone which was identified as a key risk during project preparation.

¹⁶ Section 4.01, Article IV

¹⁷ According to SALCAB the operators also defaulted on their financial obligations and only paid \$641,000 out of \$1.08 million which led to SALCAB running at a loss.

¹⁸ <http://salcab.com/>

proceed during project suspension as it was central to the PDOs. NATCOM completed their medium term 5-year strategic review and are restructuring their organization. NATCOM and MoIC built capacity in critical regulatory areas such as interconnection, tariff regulation and licensing. NATCOM also contracted a third-party company, Suba on January 1 2017 to monitor traffic for revenue assurance.

47. During the virtual Mid Term Review (MTR), in November 2013, the progress towards PDO was rated as Moderately Unsatisfactory despite a high disbursement rate of 91.8%. Although the ACE cable was operational, the GoSL remained in breach of their legal obligations. Discussions at the MTR focused on the GoSL's response to an official query from the Bank requesting for specific measures they intended to take to cure their breaches. The improved performance of the PIU was also discussed.

48. Project implementation proceeded efficiently once the suspension was lifted. All other project activities, except the divestiture of shares in SALCAB, proceeded as planned.

49. By project closing, the GoSL had decided to combine SALCAB and all other Government wholesale infrastructure, list them on the stock exchange and raise an IPO. SALCAB is currently engaging the Ministry of Justice to terminate the legal agreements signed with the private sector operators. The GoSL has also indicated that a new divestiture model will be designed and implemented in collaboration with the Bank to ensure compliance with WARCIP principles. SALCAB is currently offering wholesale capacity to the private sector operators at reduced prices which has supported the PDOs. As mentioned in section 2.1, WARCIP APL1-A centered around difficult policy and operational reforms and the GoSL successfully implemented some challenging reforms such as the liberalization of the international gateway which many other countries have failed to do. Nonetheless, follow on activities are required for the completion of the divestiture of SALCAB which remains the greatest risk to the PDOs.

50. The project's Quality of Supervision is rated as Satisfactory.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

51. The results framework is strong, with a clear and outcome-focused PDO. As discussed in section 1.2, the project's indicators adequately measured the project objective to improve geographic reach of broadband networks, and lower cost of communications. Whilst the number of subscribers remains a proxy for geographic coverage, the use of these indicators is standard across similar Bank projects, and allows for an adequate assessment of the PDO.

52. Both countries struggled to recruit an M&E specialist at the onset. As a result, M&E data was only collected in Liberia from May 2013. In Sierra Leone, MoIC staff were seconded to the PIU to collect M&E data until a specialist was recruited in February 2013. M&E was collected from private mobile operators, LTA and NATCOM on a semiannual basis. Both NATCOM and LTA continue to collect this data for their own records post WARCIP APL1-A.

2.4 Safeguard and Fiduciary Compliance

53. The project was rated category B for safeguards, triggering social and environmental safeguards policies however, safeguards risks were low. An Environmental and Social Management Framework (ESMF) was developed (consistent with national laws and any applicable treaty concerning international waters, and OP 4.01), as well as a Resettlement Policy Framework (RPF) for lateral cables and any associated equipment to be laid from the junction with the main cable through territorial waters and onto national shores. No adverse impacts were observed or reported during the project in line with the ESMF risk assessment.

54. The International Development Association (IDA) funding for international connectivity (component 1a) which accounted for the bulk of funding, covered membership fees and a share of ownership of an indivisible cable infrastructure asset. As such, component 1 a was not subject to the World Bank procurement process or guidelines and disbursement was swift.

Liberia

55. No resettlement was required, and social impacts were negligible in Liberia.

56. Procurement was without major incident in Liberia. IDA procurement guidelines applied to US\$5.6 million on 1b, components 2 and 3. The protracted recruitment of a procurement specialist delayed some procurements. On average, procurements complied with all World Bank procurement guidelines. Procurement was supported by a World Bank ICT procurement specialist throughout the life of the project.

57. Financial management was properly done throughout the project. In all World Bank projects in Liberia, financial management arrangements are secured by the PFMU in the Ministry of Finance. The working relationship between the PIU and the PFMU is governed by an MOU signed between both institutions, and PFMU was paid a flat fee of US\$135,000 for the duration of the project. The PFMU maintained satisfactory financial management arrangements for the WARCIP APL1-A project, with all Interim Financial Reports submitted on time and deemed satisfactory throughout the life of the project. All audits were unqualified.

Sierra Leone

58. The GoSL compensated 6 settlers who had previously occupied the land where the landing station was built, with 10 million Leones equivalent to US\$13,000. The GoSL consulted with the affected community and kept the country informed through publications and broadcasting.

59. The procurement risk was rated HIGH throughout the duration of project as procurement capacity was limited and the PIU struggled to recruit and retain procurement experts. The PIU was initially supported by a part time procurement consultant who trained MoIC procurement staff. Subsequently, the PIU managed procurement without a dedicated procurement staff which led to important procurements being delayed or cancelled. The ICT sector strategy for example which was key to sector reform was cancelled due to the poor quality of firms selected. Once the project suspension was lifted, key procurements had to be completed within a short period of time. Approval was therefore granted for procurements to be accelerated for the remaining period. The World Bank procurement team continued to support the PIU.

60. Financial Management (FM) initially suffered serious lapses and was not compliant with the Bank's financial management requirements so the GoSL did not renew the FM specialists contract. In 2012, disbursements of \$23.7 million were delayed due to limited FM capacity, PIU errors, and slow responses from Ministry of Finance on e-signatures. These delays prevented GoSL from paying their ACE contribution. Not only were they charged penalty fees, but their portion of the cable was not activated until their arrears were settled. The project team also observed various accounting irregularities including missing double entry record systems for financial transactions, missing consistent month end close processes, missing supporting documents for expenses related to overseas travels, missing prenumber payment vouchers, FM specialist performing incompatible duties such as preparing and reviewing payment vouchers and recurring high transaction costs. The Bank team noted that internal audits were not being conducted as the audit team was denied access to the financial records by the PIU. The Bank team built fiduciary capacity through various trainings including peering the FM specialist with FM specialists in projects with excellent ratings. Subsequently, FM and Contract Processing compliance ratings improved from moderately unsatisfactory to moderately satisfactory. Nonetheless, FM arrangements still registered short comings as financial reports continued to be delayed especially during project suspension. As at project closing, the risk remained substantial.

2.5 Post-completion Operation/Next Phase

Liberia

61. CCL has operated largely independently from the project since the cable became operational in 2013. As the infrastructure and adequate PPP contractual agreements are in place, no specific follow-up arrangements are required for CCL. The Universal Access Fund has been created and its regulatory and operational structure established. The seed capital provided should enable private investments to continue to grow. The fund for Universal Access should push mobile coverage to increasingly remote areas of the country.

62. It is highly likely that the project's objectives will fully met in the future, as the WARCIP APL1-A project established the necessary infrastructure and strengthened the policy, regulatory and institutional capacity. Yet, challenges still remain for the sector. Fully connecting all of Liberia to low cost, reliable broadband requires private sector actors to capitalize on the newly available bandwidth to deliver expanded service to the population. While significant progress has been made, the lack of a terrestrial broadband network remains a bottleneck. At project closure, there was recognition between the GoL and private players of the need for such infrastructure. The Bank continues to engage with sector partners on how to finance and operate any rollout in collaboration with IFC. As an initial step towards a terrestrial backbone, a recently announced partnership between GoL, The United States Agency for International Development (USAID) and Google is expected to construct a metro fiber ring within Monrovia to provide a fiber link between CCL and the rest of the capital city, greatly improving access for its residents, government offices, and mobile operators.

63. The World Bank continues to engage with Liberia on possible follow-up operations in the telecommunications sector to improve access to affordable services.

Sierra Leone

64. As discussed in section 1.1, regional integration is critical for Sierra Leone's economic development. The combination of ACE and the ECOWAN national backbone which stretches from Liberia to Guinea, positions Sierra Leone as a link to regional interconnection. The GoSL needs support to expand their national infrastructure to the border of neighboring countries for cross border connectivity.

65. As indicated in section 2.2, wholesale and retail prices for both fixed broadband are still unaffordable. The divestiture of SALCAB and the completion of the ongoing regulatory reform are critical to ensure nondiscriminatory, transparent and open access to essential facilities so wholesale and retail prices can drop further. The GoSL also needs support for the development of local content to stimulate demand for the increased capacity.

66. The GoSL's interest in developing an e Government project to improve their public service delivery is fully supported by the Bank. A similar project was being prepared in November 2012 but was cancelled as the overall policy environment was not conducive. The preparation of a new project provides the Bank with an avenue to support the GoSL to complete pending activities and stimulate demand for broadband by launching e Government. Another key consideration for any new project is the inclusion of a national e ID system to support the GoSL's digitization of public services.

3. Assessment of Outcomes

67. The impact of WARCIP APL1-A has been transformational for Liberia and Sierra Leone as the first countries in the APL. The success of this project rippled to all other WARCIP countries and reshaped the telecommunications landscape in West Africa. Both countries laid the foundation to build digital economies through this project. As detailed below, the high speed, high capacity connection to the global internet provided by the ACE cable and the associated regulatory changes and capacity building continues to catalyze the growth of the sector and the wider economy.

3.1 Relevance of Objectives, Design and Implementation

Relevance of Objectives

Rating: High

68. The WARCIP APL1-A's primary purpose was to support connection to the ACE cable and provide greatly increased broadband capacity at a reduced price. WARCIP APL1-A's objectives continue to be in line with both Liberia and Sierra Leone's development priorities. The project helped both countries to address their international connectivity gaps whilst supporting the development of competition in their telecommunications sectors.

69. At project approval, the PDO was clear, realistic and important to Liberia and Sierra Leone's development. The PDO was clearly worded and shared by all WARCIP projects. Access

to affordable broadband connectivity has been shown to contribute to economic development. The project was aligned with the CAS at the time of approval was clear. The PDO was largely reasonable for the scope of the project and aligned with the borrower's capabilities.

Liberia

70. The WARCIP-Liberia project is consistent with the country's long term vision for socio-economic development, as laid out by the government in *Liberia Rising 2030*, and in its Medium Term Economic Growth and Development Strategy (2012-2017), *Agenda for Transformation: Steps Toward Liberia RISING 2030 (AfT)*.¹⁹ The project is also aligned with the country's Telecommunications and ICT Policy (2010-2015), which has the objective of developing telecommunications infrastructure to support the deployment of ICT services.

71. The World Bank's Country Partnership Strategy (CPS) 2013-2017 identifies the growth of the telecom sector as a priority for the World Bank's ongoing engagement in Liberia. The CPS's pillars are aligned with those of AfT, and Pillar 1 of the CPS includes a focus on telecommunications. The CPS mentions the WARCIP APL1-A's impact on the availability of high quality internet in Liberia, and lays out a variety of areas where the Bank could support Liberia consolidating these gains. The CPS includes indicators aligned with those of the WARCIP-Liberia project.²⁰

Sierra Leone

72. The GoSL plans to achieve middle income status by 2035 as articulated in their '*Agenda for prosperity, road to middle income status (2013 – 2018)*' by using ICT to reduce poverty and boost prosperity. This strategy recognizes WARCIP APL1-A's role in laying the foundation to expand ICT to other sectors including agriculture, mining, fisheries, and tourism.

73. GoSL intends to improve transparency, public service delivery, education, health and job skills by improving international competitiveness (pillar 4), labor and employment (pillar 5), good governance (pillar 7) and human development (pillar 3). They plan to empower their citizens through ICT and reduce poverty. WARCIP Sierra Leone is aligned to both the *agenda for prosperity* and *The National ICT policy (2016)*' which are all designed to support Sierra Leone's political, social and economic development. WARCIP APL1-A remains relevant to the current Country Partnership Framework (CPF).

Relevance of Design

¹⁹ This five-year development strategy establishes the goal, "to facilitate universal access, transparency, reliable and low cost postal, telecom and ICT services nationwide" as part of its infrastructure pillar, as well as an outcome indicator of "Improved coverage and quality of Internet and phone services", highlighting the continued relevance of the WARCIP project and its objectives to the country's development goals.

²⁰ CPS Pillar 1 Outcomes include "Increased access to telecommunications services" and associated indicators include i) access to internet services (number of subscribers per 100 people) increases from 1.7 to 3, and ii) Volume of available international capacity, international communications (internet, telecoms, and data) bandwidth (Gbit/s) increase from 0.07 to 1.12.

Rating: Substantial

74. The project's design (including activities, components, and policy areas) remains relevant to the countries development objectives. The activities carried out by the project were necessary to meet the PDO, and progress has been substantial. Connection to the ACE cable and establishment of the CCL and SALCAB structure for operation and delivery have proven highly beneficial to the sector, government parties, and the citizens of Liberia and Sierra Leone. The strength of the project design is reflected in Sierra Leone where all the PDOs have been met even though not all activities were completed. On the policy side, the project provided advisory support and capacity building for a wide range of actors within the GoL and GoSL's telecommunications sector. These activities supported the government to adapt to the arrival of the ACE cable.

75. As described above, the project's M&E was in line with other similar projects (including all other WARCIP projects) and appropriate for the PDOs. The PDO indicators were clear, realistic and meaningful, and were related to outcomes for which the project could reasonably contribute. The indicators were defined with quantitative baselines and targets. The PDO indicators properly reflected sector performance and captured progress to project objectives. Intermediate indicators were similarly relevant, providing additional detail on available capacity, prices and the project's technical assistance. Indicators were straightforward and largely relied on standard market indicators available from private sector operators.

Relevance of Implementation

Rating: High

76. Implementation was highly responsive to the project's needs and the countries changing priorities. This was mostly due to effective communication between all stakeholders and flexibility on the part of the Bank, the borrower, the implementing agencies and the PIUs. Despite the Ebola crisis and project suspension, flexibility on the part of all parties enabled implementation to continue successfully. To date, LTA and NATCOM continue to collect the M&E data to track their progress in broadband penetration. The GoSL have also communicated their intention to collaborate with the Bank to divest their shares in SALCAB without deviating from the WARCIP principles and objectives. As discussed in section 2.5 both Governments plan to develop e Government programmes on WARCIP APL1-A's foundation.

3.2 Achievement of Project Development Objectives

Rating: Substantial

77. The causal chain between the project, components, indicators, and outcomes was straightforward. ACE provides Liberia and Sierra Leone's sole linkage to high speed international bandwidth. The availability of this capacity, supported the development of a competitive retail market, resulting in decreasing wholesale and retail prices, and increased geographic coverage. Technical assistance strengthened the overall capacity and efficiency of the sector.

Liberia

The volume of available international internet capacity exploded after the ACE cable landed in Liberia, with an estimated 100 fold increase in the first year and another 10 fold increase in 2016. The initial spike in capacity (from .065 Gbits/s to 6.5 Gbits/s) was due to the landing of the cable, and the subsequent jump (up to 62 Gbits/s) due to an upgrade planned as part of the initial ACE rollout. This expansion can be tied directly to the project, as nearly all of the available capacity is through the ACE cable. Considering the country's relatively low population and the size of its ICT sector, this massive expansion in capacity has had dramatic and irrevokable positive impact on the telecom sector.

78. Use of this capacity also expanded from a baseline of 1 kbit/s/person to 35 kbit/s/person by project closure. While the project's target of 40 kbit/s/person was not met, the trend is strongly positive. Of all PDO indicators, volume of traffic is likely most impacted by the absence of a terrestrial network in the country. A large pool of available capacity is only useful if it can be readily distributed to end users. Without ready access to fixed line connections, the ISP market has been slow to develop and the roll-out of higher speed mobile internet has been a challenge. The recent increase has been driven by newly available low cost 3G mobile connections and sharply dropping prices for internet enabled mobile phones.

Sierra Leone

79. The volume of available international internet capacity in Sierra Leone exploded as a direct result of the ACE landing in Sierra Leone. The capacity measured at 0.04 Gbits/s in 2011 before the cable landed. Once the cable became operational in 2013, the capacity moderately increased to 8.06 Gbits/s within two years. However, in 2016 the capacity spiked to 80.445

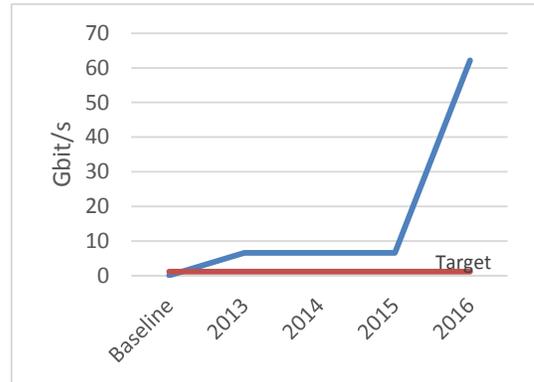


Figure 3: Volume of Available International Capacity

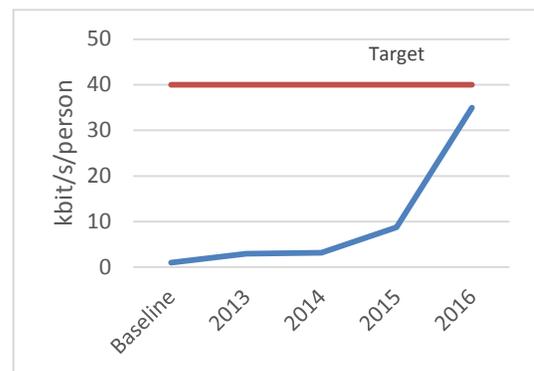


Figure 4: Volume of International Traffic

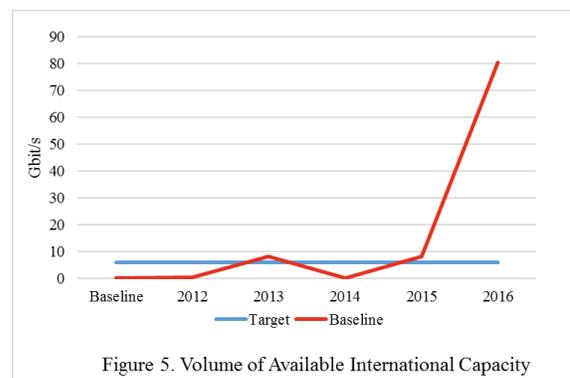
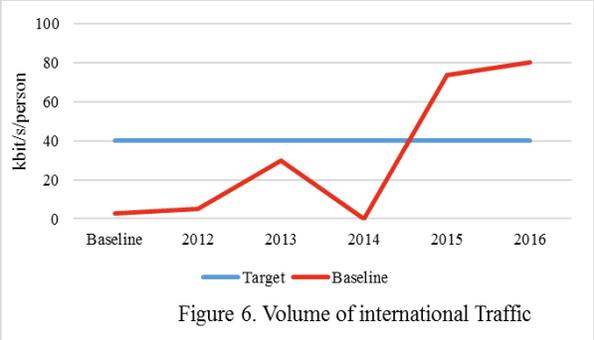


Figure 5. Volume of Available International Capacity

Gbits/s once the ACE capacity upgrade was completed immediate. The impact on the telecoms sector and country at large was immediate. Free Wi-Fi became available in public places, innovative applications were launched by service providers and coverage increased.

80. The available capacity per person also showed similar trends. Before ACE, capacity per person was 3Kbit/s per person which increased marginally to 5kb/s person in 2011. Post ACE, this increased to 30kb/s per person by 2013 and by project closing, the capacity was at 80.2 kbit/s per person. One of the reasons Sierra Leone surpassed this target because they invested in national infrastructure to distribute capacity to end users. They completed the first phase of the in-country Fiber Terrestrial backhaul distribution network as well as a 1010 KM in-country core Fiber backbone network which covers 70% of the country. They also plan to complete a second phase which will include a ring of Terrestrial Fiber backbone to distribute huge traffic from the landing station across the country to the end users. Despite Sierra Leone’s relatively small population of approximately 7,557,212, there has been a high demand for mobile and internet services which service providers are striving to meet.



Reduced Cost of Communications Services

81. The dramatic expansion in available capacity, combined with an increasingly competitive ICT market, led to a drastic reduction in wholesale and retail internet prices in both countries. The wholesale prices dropped by 90% in Liberia and 98% in Sierra Leone similar to comparator countries such as São Tomé and Príncipe, where the ACE cable landing resulted in a 72% drop in wholesale prices.²¹

²¹ See Implementation Completion and Results Report for the Central African Backbone Program (APL2) in the Democratic Republic of São Tomé and Príncipe (P117652)

Liberia

82. Wholesale prices for fixed broadband fell dramatically, from US\$8,000 per month for E1 capacity to US\$750 at project closure. Retail prices for fixed broadband also dropped from US\$1,200 per month to \$400 at project close.²² This is still above regional averages, due largely to the absence of terrestrial network to distribute service to customers. Furthermore, fixed broadband prices remain very high compared to average income in the country (GNI per capita of US\$380 per year in 2015). However, retail prices are likely to continue to fall as the announced Monrovia metro fiber project becomes effective and smaller ISPs are able to enter the market.



Figure 7. Prices

83. The largest new market of internet users in Liberia are those reached by mobile broadband service. While not a project indicator, the introduction of the ACE cable allowed for mobile broadband to be offered to many Liberians. Since its widespread launch in 2013, the estimated price for service has fallen from US\$38.87 for 500 MB per month, to around US\$4 by the end of the project, reaching affordable prices for many in the country.²³

Sierra Leone

84. Whole sale prices for fixed broadband E1 capacity dropped by 97% from \$8000 to \$174 by project closure, far beneath the target of \$2000. SALCAB contributed significantly to this by introducing a 10% discount on wholesale prices for private sector operators and reducing STM1 and STM4 to \$20,000 and \$40,000 respectively from December 2016 with plans to sell double the amount of bandwidth for the same price by January 2017.²⁴

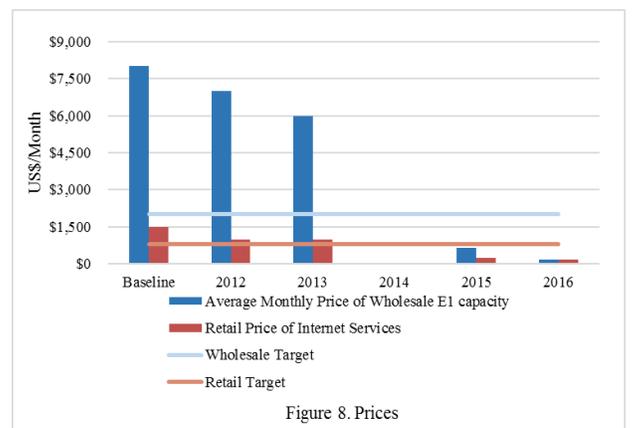


Figure 8. Prices

85. The decrease in wholesale prices trickled down to fixed broadband retail prices. Prices dropped from \$1500 before ACE to \$180 at project closing but remains unaffordable for the average Sierra Leonean. The gap in the market has been filled by mobile broadband which is in

²² Retail prices were collected directly from operators as part of the project's M&E monitoring. It covers the retail price of a broadband subscription, averaged between operators.

²³ Mobile broadband prices based on ITU data. *Measuring the Information Society Report*, annual reports for years 2013-2015

²⁴ The STM1 and STM4 discounts only applied to operators who had cleared their outstanding debts to SALCAB and there was a six-week waiting period for the circuit to be activated.

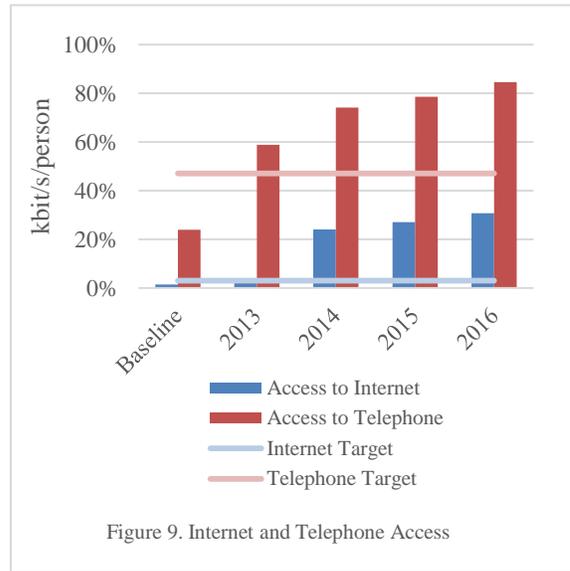
high demand and has become increasingly affordable since ACE, with average users paying \$4.7 for 500 MB per month.

Increased Geographical Reach of Broadband Networks

86. The WARCIP APL1-A project successfully expanded the geographical reach of broadband networks and reduced costs of communications services in Liberia and Sierra Leone.²⁵ The project began to effectively unlock the ICT sector in the country, with tangible results already emerging and even greater impacts expected in coming years as low cost international connectivity continues to drive changes in the market, and a competitive open access policy regulates and ensures competition. While the project did not measure the actual share of the country covered by broadband networks, falling prices and expanded capacity have had a clear impact on the share of the population with access to mobile telephone and internet services.

Liberia

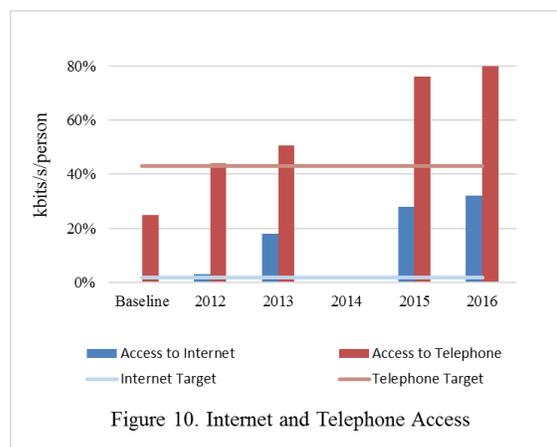
87. Based on strong competition between operators and improvements in handset technology, the number of Liberians with access to a mobile phone increased dramatically over the life of the project. The share of the population with access to mobile internet services rose from 1.5% prior to project implementation, to 30.8% as of 2016. This dramatic increase far surpassed the established target of 3%, and was almost entirely due to the expansion of 3G mobile broadband. This expansion can be traced back to the opening of the ACE cable, as the mobile operators providing this service are all stakeholders in ACE, and their 3G services are nearly fully reliant on connectivity through CCL.



²⁵ As discussed above, M&E data collection was not performed in the period between project approval and May 2013. Baseline data and was collected during project design and the resumption of data collection coincided with the start of the ACE cable’s operation. As no major changes occurred in the sector between baseline data and the opening of the cable, it can reasonably be assumed that the dramatic changes in the indicator results are due to the project’s impact and not to something else happening in the interim

Sierra Leone

88. As a result of WARCIP APL1-A, internet in Sierra Leone is no longer considered a luxury for the elite. Before WARCIP APL1-A, only 0.28 Sierra Leoneans had access to internet services and by project closing, this number had increased to 32. Access to mobile services increased from 25% of the population to 80% of the population by project closing. Increased access was a direct result of the ACE cable as operators upgraded and expanded their networks and provided connectivity through SALCAB. Sierratel for example embarked on an infrastructure modernization project. They upgraded their fixed line network to support ADSL services in 2014 as well as end users broadband access, to a maximum downlink speed of 5Mbps as well as improving GSM voice services. The other private operators launched 3G, 4G, LTE and a host of innovative applications and services.



3.3 Efficiency

Rating: Substantial

89. During project preparation, the World Bank supported a study comparing a variety of options for achieving connectivity, including continued/expanded use of satellite connectivity, leveraging already established African submarine cables through cross border linkages, and joining the ACE consortium. This analysis determined that, despite higher upfront capital costs, the ACE cable presented the best long term option. The high data transfer costs associated with continued use of satellite connectivity or leveraging of other African submarine cables was estimated to quickly overwhelm the initial cost of ACE. In addition, the scale of bandwidth made available through the ACE cable was generally unavailable through other options.

90. ACE constituted the most cost-effective option for Liberia and Sierra Leone to access high-capacity international connectivity, the public resources allocated to the project were necessary for its viability, and it is expected to have a lasting impact on the country's GDP. Comparing with similar projects in the region (including those leveraging the ACE cable opportunity), the WARCIP APL1-A was completed in an efficient manner. Analysis shows that the ACE cable opportunity was the most efficient way of achieving connectivity, and project funds not allocated directly to ACE consortium fees were limited and directly focused on supporting connectivity. The project's overhead was in line with similar projects.²⁶ In short, the

²⁶ Project component 3 Project Implementation (originally allocated at \$1.28, and increased to \$1.65 to cover project extension) was in line with other WARCIP projects (for instance: Guinea-Bissau - \$1.39 million, the Gambia - \$1.705 million, Guinea - \$1.5 million, Burkina Faso - \$1.26 million).

project's efficiency was substantial. See Annex 5 for a summary of financial and economic analysis.

Liberia

91. A financial analysis of the project performed at project closure confirms this assessment, highlighting that CCL is not making undue revenues for its private stakeholders over the near or medium term based on their initial investment (with an IRR of 7% over the life of the project when considering only private CAPEX), and that public sector investment was necessary in order to make the project viable (with an IRR of -5% over the life of the project when considering total CAPEX).²⁷ CCL's pass-through structure, whereby stakeholders acquire a portion of the cable's available capacity as a benefit to their ownership stake has proven to be an effective mechanism for owning and operating the ACE cable landing station. As CCL's design largely eliminates its ability to generate profit, near all cost savings derived from the expanded capacity are passed on to the customer.

92. As telecom users have been shown to be highly responsive to changes in price, the lower prices generated by the landing of the ACE cable, coupled with CCL's pass-through model, and Liberia's competitive mobile telecom sector has generated growth in the Liberian economy. While some mobile broadband coverage was available prior to the launch of capacity through CCL (covering 1.5% of the population in 2013), the growth rate was limited and unlikely to substantially increase. WARCIP-Liberia has already had a dramatic impact on coverage rates (more than 30% of the population by project closure) with continued increases likely. Based on World Bank research, this increased penetration has already added more than \$250 million to the Liberia's GDP over the life of the project, with the yearly impact expected to reach nearly \$600 million by 2021, far exceeding the upfront cost of the project.

Sierra Leone

93. Based on the financial analysis performed at project closure and on the 2010-2016 high-level financial statements provided by SALCAB, it appears that SALCAB is financially sustainable as it has covered its operational expenditures since 2014. The breakeven point, excluding capital expenditures - cumulated free cash-flow (FCF) excluding the capital expenditures has been positive since 2014. However, as with Liberia, the generated net revenues (defined here as the gross revenue minus the operational expenditures and the income tax) are not sufficient to cover the massive capital expenditures that were required to build the asset: over the 2010-2016 period the internal rate of return (IRR) of the project when considering overall CAPEX is -35%; and 2% over the estimated 2010-2029 period, which confirms that the project could not have taken place without the assistance of public funds.

94. The lower costs and improved capacity provided by the landing of the ACE cable substantially increased broadband penetration, with the most dramatic increase coming in 2013, the year following the landing station initiating services (mobile broadband rates increased from 3.1% to 18% in Sierra Leone), and it is expected to reach 42.3% by 2022, as opposed to the

²⁷ See Annex 5 for a more thorough discussion of the findings of the financial analysis.

12.4% estimated without WARCIP APL1-A. In order to estimate the project's impact on GDP, both during the life of the project and projected through 2022, mobile broadband penetration rates were estimated with and without the project. Based on this analysis, by the end of 2016 the project had contributed nearly \$1 billion to that of Sierra Leone, reaching an estimated \$1.6 billion by 2022. In terms of GDP growth, broadband penetration is estimated to account for an average of 4.6% of the total yearly growth until 2022 since SALCAB began providing capacity.

3.4 Justification of Overall Outcome Rating

Rating: Satisfactory

95. Based on the below-mentioned factors, the overall outcome rating is Satisfactory. The project was highly relevant for both countries, efficiently achieved its goals, and contributed to substantial and sustainable changes in the sector.

Liberia

96. Despite the impacts of the Ebola crisis, WARCIP APL1-A connected Liberia to reliable and affordable international connectivity for the first time. It created a PPP structure to deliver cost savings to end users, supported legal and regulatory reform to encourage further development of the enabling environment for a strong competitive ICT sector, and strengthened the capacity of those institutions tasked with governing the sector. The PDO indicator which was not met in Liberia (volume of international traffic) does not directly measure either of the PDOs. Those indicators directly associated with the PDO far surpassed their targets.

Sierra Leone

97. There is no doubt that WARCIP APL1-A has positively impacted Sierra Leone. Sierra Leone has connected to reliable international connectivity and all PDO indicators have been surpassed. Wholesale and retail prices have dropped, geographical coverage has expanded and Sierra Leoneans continue to benefit from increased access to mobile and internet services. Fixed broadband services however remain unaffordable.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

98. The gender impacts of the project are informative, and highlight a challenge for other countries rolling out mobile service at scale. This trend is common in many low-income countries, and in Africa in particular, with initial roll out of mobile connectivity impacting primarily men. Yet, the gains afforded to women who are able to access mobile phones and the

internet can be dramatic, highlighting the continued need for policy actions that directly equip women to take advantage of these opportunities.²⁸

Liberia

99. As highlighted in Figure 11, the number of beneficiaries (total subscribers) increased dramatically over the life of the project and more than doubling in 2014 alone. While this includes all subscribers of telephone or internet services, the lack of a terrestrial backbone implies that these numbers are driven almost entirely by mobile subscriptions. While the overall number of women with access grew steadily each year, rapid gains went disproportionately to men, with the share of female beneficiaries declining in 2014.



Figure 11: Project Beneficiaries by Gender for Liberia

Sierra Leone

100. Because WARCIP APL1-A increased capacity and reduced broadband prices, some private sector operators were able to provide free wifi services in some areas. The connectivity activity in component 2 also provided connectivity to 10 schools, 10 universities, and 10 MDAs. These interventions increased both male and female access to the internet. It is not clear how this data was collected and it may not be indicative of the gender disparity in Sierra Leone.

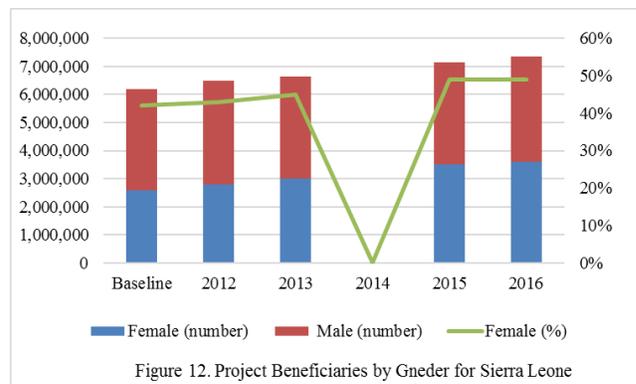


Figure 12: Project Beneficiaries by Gender for Sierra Leone

(b) Institutional Change/Strengthening

101. The project provided significant institutional strengthening for all stakeholders. A key area that WARCIP APL1-A tried to build capacity in was PPP management. The project provided both countries with PPP experts during the design, negotiation and management phase. The challenges that were faced during implementation in Sierra Leone relating to the failed divestiture are more attributable to policy decisions and weak Government commitment as opposed to capacity challenges. Both countries are currently planning the development of

²⁸ Mobile phone access can alleviate constraints faced by women in coordinating their family and work lives, reduce the cost of money transfer, and improve information gathering. Internet access can support female entrepreneurs in connecting to domestic and international markets, and enable a flexible work environment more conducive for women with children. See the *World Development Report 2012: Gender Equality and Development*, and the *World Development Report 2016: Digital Dividends* for further discussion.

expansion of their national backbone infrastructure. The use of a PPP model, which they have experience in designing and managing will assure them of efficient implementation and sustainability. Both countries have developed capacity in E Government and already established offices with regards. A variety of trainings and capacity building was also provided and the project funded a series of studies and advisors to help LTA and NATCOM better understand the market, and draft competition guidelines, regulations and safeguards.

(c) Other Unintended Outcomes and Impacts (positive or negative)

102. The increased penetration and access to mobile phones as a result of WARCIP APL1-A proved invaluable during the Ebola crisis as mobile phones served as the primary means of communications in both countries. In areas with higher mobile penetration, information flowed more readily, responses were better coordinated and more lives were saved. Cell data records were analyzed to combat the epidemic by tracking travel patterns of people who were exposed to the virus to assess where the disease was likely to spread to which helped to focus limited health resources.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops²⁹

103. The PIU for WARCIP Sierra Leone conducted a nationwide consumer perception survey specifically for this ICR to determine whether the achieved PDOs were positively impacting users in reality. The survey sampled 25,617 people over the age of fifteen (15) in six (6) different municipalities of which seventy one percent (71%) were female and twenty nine percent (29%) were male. The results of the survey tallied with the PDOs as the majority of respondents opined that prices were decreasing, quality of service was improving and access to services was increasing. Approximately sixty seven percent (67%) of respondents considered mobile broadband services affordable and eighty three percent (83%) noticed a marked improvement in speed and reliability of the internet after ACE was launched. Eighty two percent (82%) of respondents also agreed that network coverage had expanded after ACE landed.

4. Assessment of Risk to Development Outcome

Rating: Substantial

Liberia

Rating: Moderate

104. Technically, the ACE cable will remain sufficient to meet Liberia’s connectivity demand far into the future. While there is some short-term risk to Liberia’s connectivity from a cut to the ACE cable, any discontinuity of service would likely to be limited in duration and its repair the responsibility of the ACE consortium. The GoL has already begun to explore alternative connections to its neighbors to establish redundancy.

²⁹ The survey was only conducted in Sierra Leone. A detailed report is attached as Annex 10.

105. Financially, there is little risk to the project. Investment in the telecom sector is largely a private sector endeavor, with public investment (as in the WARCIP-Liberia project) necessary only to kick-start development in fragile, small, or otherwise high risk markets. There is some uncertainty within the CCL stakeholders of who should cover the operation and maintenance of the landing station in the long term (as CCL's pass-through structure prevents significant profit generation), there is little financial risk to its operation. Connectivity to the ACE cable is too structurally important to all stakeholders and to private sector revenue generation, to allow such uncertainty to threaten CCL's operation and thus the project.

106. Identified during design as a potential key risk, divestiture of GoL's stake in CCL has not occurred yet. This lack of divestiture can be explained as a desire to maximize the potential return on its investment as completion of upcoming terrestrial backbone projects are expected to increase the value of the government's shares in CCL. In addition, the structure of CCL as a pass-through has prevented any significant profit generation, and eliminated the incentive for the GoL to maintain shares for that purpose. However, World Bank experience with similar projects in the region highlights the tendency for governments not to divest and in doing so impact the confidence of potential investors in the sector. Until divestiture takes place, this remains a risk to the project's results over the medium to long term.

107. Continued uncertainty concerning the future of the national incumbent operator, LTC, may limit future gains in the sector and Liberia's ability to fully capitalize on WARCIP APL1-A. The project provided support to LTC, funding a repositioning study and 5-year business plan and hands-on technical support. Yet, these plans have not yet gone into effect, and LTC's sectoral and political positioning going forward remains unclear. This has injected some uncertainty into the market as a whole and could potentially limit future investments in infrastructure by private operators.

108. Liberia's status as a fragile state makes it impossible to preclude political risk entirely. However, the risk to the WARCIP-Liberia project and the telecom sector more broadly is very limited. Other risks, including economic, social, and environmental are all deemed to be negligible due to the nature of the project.

Sierra Leone

Rating: High

109. The proliferation of low cost fixed broadband in Sierra Leone is dependent on the implementation of the pending structural changes in telecoms market. SALCAB divestiture and regulatory reforms pose the greatest risk to the PDOs. This risk is two-fold because fixed broadband is not universally affordable and accessible to the average Sierra Leonean. Therefore, unless these structural changes are implemented, the PDOs will not just reverse but further widen the digital gap that already exists.

110. The biggest risks to connectivity are the ACE planned maintenances and cuts from human error, especially ships. During these periods, private sector operators will use either VSAT or STM4 for redundancy which is expensive. The GoSL is currently exploring alternative connection options with neighboring countries to provide cost effective redundancy.

111. The financial risk to the project emanates from the GoSL's decision to combine SALCAB and all other government owned wholesale telecommunications infrastructure projects for financial and operational purposes. SALCAB needs to generate revenue to meet its financial obligations for the IDB loan, operation and maintenance costs for ACE, operation and maintenance costs for the national backbone infrastructures and their own administrative costs. The 3 private sector operators who remain legal shareholders of SALCAB will not contribute to the ACE operations and maintenance costs as they are precluded from exercising any form of control over the company. SALCAB has been steadily reducing prices for wholesale capacity and there is a risk that this trend may reverse so that they can meet their financial obligations. Failure to meet the operating and maintenance costs could also result in punitive actions including disconnection from ACE.

112. A delayed and inefficient divestiture of SALCAB was identified as a key potential risk during project design. Before the GoSL's proceeds with the proposed divestment of combined assets, they need to unwind the 2013 PPP agreements and settle resulting liabilities and losses to the private operators or risk legal action being filed which may disrupt the development outcomes. The private sector may also seek compensation from GoSL for losses incurred from the failure to comply with the January 2013 agreement. Potential investor who conduct due diligence may also uncover and query any legal or financial irregularities.

113. The risk to the enabling environment emanates from policy and regulatory decisions. The positive effects of liberalization could be hampered by the imposition of additional levies and price caps on mobile and international gateway termination by NATCOM. Delays in regulatory processes may also reduce investor confidence. NATCOM's decision to lead the establishment of an IXP, which is typically managed by the private sector, is contrary to best practice and should be reconsidered.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

114. According to the borrowers, implementing agencies, other in country stakeholders and as evidenced by project milestones, the Bank team provided all necessary support to the governments during project preparation. The project's design, PPP structure, and reliance on the international consortium to deliver the technical components of connectivity to the submarine cable was designed to simplify implementation, allow for timely disbursement of project funds, and establish the project on a firm foundation.

115. As discussed in section 2.1, project preparation was conducted under tight timelines due to ACE requirements, with the World Bank team providing timely and intensive response to the government. Building on broad experience, the World Bank established a PPP model for the ownership and operation of CCL and SALCAB. This structure was designed for rapid buy in from a wide variety of participants in the telecom sector and sustainable operation of the landing station to promote lowest possible prices for end users. In addition, the World Bank supported

the GoL, GoSL and private partners to negotiate effectively with each other and the ACE consortium, to allow the countries to participate in the cable and avoid jeopardizing the stakeholders' financial obligations.

116. Project design at entry proved robust, appropriate, and successful, with the project achieving its development objectives despite major restructuring and the delays caused by the Ebola crisis and the project suspension. The TA and capacity building put in place as part of component 2 enabled the project to successfully secure membership in the ACE cable and ensure an enabling environment by which the capacity could be harnessed by a competitive private sector and government entities to deliver lowest cost service to end users. The project's designed structure remained appropriate throughout implementation and ensured that the project was successful despite the challenges during implementation.

(b) Quality of Supervision

Rating: Satisfactory

117. The Bank team ensured close supervision of the project, both during and between missions. Frequency of supervision was adequate, averaging two formal supervision missions per year, and was supplemented by intensive remote support. In particular, the project team should be commended for their ongoing support through the Ebola crisis, with supervision missions continuing in line with the project's supervision schedule and World Bank Liberia and Sierra Leone Country Office staff sustaining engagement throughout.

118. The Bank and various government actors worked together well in most instances to address issues impacting the project as they arose. This was reflected in Sierra Leone when the Bank's senior management got actively involved in resolving the legal breaches by GoSL by engaging them physically in Sierra Leone and DC and continuously consulting with the project team. The project team continued to support the GoSL towards compliance even during project suspension. For example, the legal advisory activity to amend the telecommunications law to reverse Sierratel's monopoly was exempted from the suspension as this support was critical to achieving the PDOs. Even where project cancellation was legally justified, the team opted to continue to work with GoSL towards compliance which yielded very positive outcomes.

119. The change in TTLs during Implementation had minimal impact on the success of the project, with World Bank support remaining at a high level. Implementation and stakeholder engagement were documented through comprehensive aide memoires, ISRs were filed on time, and ratings properly reflected project status.

120. M&E targets should have been revised during the restructuring review for project extension. While initial targets were reasonable, at the time of the extension many of the targets had been far exceeded due to better than expected roll out of 3G mobile internet and a drop in mobile phone prices. Although a common challenge for ICT projects, where advancing technology over a project's life cycle frequently makes initial targets outdated, revised targets could have provided a more realistic assessment of the project's success.

121. Overall, the World Bank team responded adequately to project demands. According to the implementing agency and other project stakeholders, the project's success was partially due to frequent and effective communication between the World Bank team and project stakeholders. A review of project documentation validates the team's demonstrated adaptability to evolving priorities and effective engagement with project stakeholders, with only minor shortcomings in terms of M&E targets and processing of requested changes.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

122. The World Bank's support at project entry and through implementation were strong, setting the project on a sound footing and supporting the project through evolving priorities. While a few minor issues were identified as potential areas for improvement (such as M&E targets), they did not impact the project's successful delivery. Despite the challenges generated by the Ebola crisis and project suspension, effective coordination between the World Bank team, the implementing agency, borrower, and project stakeholders was key to the project's success, with clear results.

5.2 Borrower Performance

(a) Government Performance

Rating: Moderately Satisfactory

Liberia

Rating: Satisfactory

123. The GoL (including LTA, MoPT and other public entities) was a strong partner throughout the project cycle. Despite low technical capacity in some areas and difficult conditions and changing priorities due to the Ebola outbreak, the Government was generally quick to react to project demands and remained strongly committed to the project's development outcomes. Strong coordination among a variety of GoL agencies was key to design and implementation, and the project's strong results speak to their success.

124. The GoL provided day to day support to the project through the Ministry of Finance's PFMU, which handled all Financial Management responsibilities for the project. The PFMU was universally competent and its support to the project alleviated FM demands from the PIU.

125. Divestiture of the GoL's share in CCL remains a challenge to the project's long term success. Identified as a potential risk during project design (see Annex 9), similar challenges have been seen in a number of countries. While the project has established an enabling environment for future divestment, and GoL expresses a continued intention to divest, by project closure, no concrete steps had been taken.

Sierra Leone

Rating: Moderately Satisfactory

126. The GoSL (including NATCOM, SALCAB, MoIC and other public entities) supported the project by providing financial and personnel resources when needed. MoIC provided support by seconding their staff to the PIU when necessary. SA LCAB financed the PIU's costs during project suspension and provided support to the connectivity activity. NATCOM provided the funding for the \$82,000 ACE penalty fee to enable the activation of the cable. SALCAB has continued to connect additional schools and institutions after project closure at their own costs.

127. During project preparations and negotiations, it was made clear and agreed that private sector participation was critical to the success of WARCIP APL1-A and formed the basis of the Bank's support to GoSL. Nonetheless, the GoSL deviated from the agreed design without following due process which compromised the core principle of the project, the sustainability of the PDOs and the confidence of the private sector operators. A more constructive approach would have been to request for a review of the PPP model in line with GoSL's economic, social and political needs. A revised model could have been developed to balance the GoSL's development objective, the private sector operator's investments and the mitigation of the potential risks.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Satisfactory

Liberia

Rating: Satisfactory

128. LTA was highly effective in its role of project coordination and implementation. LTA managed the project in an efficient and proactive manner, ensuring that the many project stakeholders and government entities were involved and informed as needed. According to public and private stakeholders, effective communication on the part of LTA and the PIU were key to the project's success. LTA remained committed to WARCIP-Liberia throughout the life of the project.

129. LTA and the PIU ensured compliance on procurement and safeguards in a satisfactory manner. Overall, reports and audits were submitted in a timely manner. Generally, LTA and the PIU remained appropriately staffed throughout the project, with the Chairperson of LTA and the PIU's project coordinator remaining onboard and committed throughout the life of the project. While there was some turnover with respect to the procurement specialist and difficulty securing an M&E specialist delayed data collection, these issues were only minor and did not negatively impact the performance of the project.

Sierra Leone

Rating: Moderately Satisfactory

130. Although the PIU reported to the Permanent Secretary MoIC, they worked relatively independently throughout the project. The PIU was efficient at coordinating and monitoring activities. They were actively involved in ensuring that the connectivity activity was completed on time and made frequent site visits. Despite all the project extensions, the PIU operated within their initial budget. They did have limited capacity in procurement and financial management.

Financial audits were delayed and some procurements were cancelled due to inefficient processes. The PIU continued to work during the period of suspension and after project closing.

131. The GoSL worked well with the Bank to rectify their procurement and financial management issues which resulted in improved procurement processes, better contract management and increased disbursement. The PIU was responsive and flexible to the needs of the project. The M&E data was collected efficiently even during periods that a dedicated M&E specialist had not been recruited by the project. However, M&E data was not collected during the period of suspension.

(c) Justification of Rating for Overall Borrower Performance

Rating: Satisfactory

132. In light of the above, the overall performance of the borrower is rated moderately satisfactory. WARCIP – Liberia and Sierra Leone involved relatively complex technical components and both ICT sectors are young and still of low capacity in some respects. Despite the challenges created by the Ebola outbreak and project suspension, the project generated successful outcomes. The GoSL remains in breach of its legal obligations as the divestiture of SALCAB is pending.

6. Lessons Learned

Lessons learned include:

- a. Despite their social, economic and historical similarities, Liberia and Sierra Leone had completely different experiences establishing their PPPs. This deviation didn't emanate from the project design as the effectiveness conditions, legal covenants and project preparatory studies illustrated the considerations of the specific nature for each country. The difference in outcomes can be attributed to government commitment, sector policies and governance structures. Moving forward, the strength of governance structures needs to be assessed to determine the appropriateness and simplicity of PPP models. Where governance structures are considered too weak to sustain the management of a PPP, then consideration should be given to including Development Policy Financing (DPF) as an instrument to strengthen implementation.
- b. A PPP structure can support the implementation of large scale private infrastructure in fragile or small markets. One area of contention among CCL stakeholders in Liberia is how operations and maintenance of CCL should be provided. In Sierra Leone, the private sector shareholders were accused of failing to adequately maintain and manage the landing station. As such, documentation establishing PPPs should detail responsibilities for operation and maintenance to ensure continued buy-in from all parties. Similarly, where initial capacity is allocated by ownership share, the impact of any capacity expansion should be clearly outlined.
- c. The project's innovative financing model, supported the country's subscription to a cable consortium membership rather than investing in cable infrastructure directly which greatly improved the likelihood of a positive outcome. Through such an arrangement,

Liberia and Sierra Leone were able to bypass their low technical capacity and leverage the expertise of an international consortium of private stakeholders whilst also improving their return on investment through an economy of scale. Such a model may prove equally effective in other infrastructure/PPP investments.

- d. Limited IDA resources resulted in a project focus on the supply side without significant attention to supporting demand and looking more holistically at sector needs in terms of content development, entrepreneurship to create content and attention to the gender dimension. While the project focus was mandated by IDA availability, a more robust approach that tackles both demand and supply, ideally in parallel or a programmatic phased approach is needed to ensure sustainability and ensure higher adoption rates to further drive down costs.
- e. Broadband internet projects are not only possible in post-conflict countries, but can be a game changer as demonstrated by the role of mobile connectivity in addressing Liberia and Sierra Leone's Ebola crisis. The Bank can play an important role in such situations by supporting public sector agencies and providing reassurance and risk mitigation for private sector actors.
- f. International connectivity infrastructure and national backbone infrastructure are key to creating supply side effects. Sierra Leone's investment in their national backbone has already yielded positive results. Liberia's partnership with google is expected to generate the same. WARCIP APL1-A focused on addressing the supply constraint as a matter of priority. The result has been increased penetration based on increased demand. The next stage is the development of digital skills and creation of demand from citizens, businesses, government agencies, etc was outside of the scope of the project. Failing to address this gap will result in citizens of both countries not leveraging the available capacity.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

Liberia

133. The implementing agency's comments and borrower ICR are included in Annex 6. Borrower comments included:

- “The Bank's ICR to a large extent adequately assesses the performance and outcomes of the WARCIP Liberia Project. We are, however, concerned that Liberia would have achieved a higher rating in Part G "Rating of Project Performance in ICRs" and in Part I "Disbursement Profile", had Liberia's performance been assessed individually instead of in combination with other WARCIP projects. We would appreciate clarity from the Bank.”

134. In response to the comments received, the data sheet in the previous draft ICR was revised to include data for only Liberia, independent of the Sierra Leone portion of the project.

Sierra Leone

135. The implementing agency’s comments and borrower ICR are included in Annex 7. Borrower comments included:

- “The Ministry acknowledges the WARCIP-SL implementation report as well as the issues highlighted. WARCIP has positively impacted Sierra Leone as we are now reliably connected to rest of the world through the ACE submarine cable. We are now seeing the resultant effect of the project through an expanded geographic reach for broadband connectivity. We have been able to take the Fibre Cable to about 50% of our district headquarter towns as well as passing through major population areas through the ECOWAN and HUAWEI projects. The implementation of this project and other related ICT projects over the years has been a learning experience for both the Ministry and the Government. You would agree with me that at the time of design of the WARCIP project, the capacity by way of personnel in the Ministry was lacking. The Ministry now has a well staff Professional wing with an eGovernment Units as a Policy and Cyber Security Units. We look forward to the finalization of this report and phase 2 of the project.”

Annex 1. Liberia Project Costs and Financing (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Component 1 – Supporting Connectivity	21.00	20.43	97%
Membership in ACE Cable	20.00	20.03	100%
Seed capital for Universal Access	1.00	0.40	40%
Component 2 – Creation of an Enabling Environment for Connectivity	3.32	3.36	101%
Divestiture of Government shareholding in CCL	0.50	0.34	68%
Legal and regulatory safeguards for open access	0.35	0.29	82%
Setting up Universal Access Fund	0.50	0.27	53%
Advisory support to LTC repositioning in the Market	0.50	0.50	100%
Backbone feasibility and Open Access regime	0.40	0.40	101%
PPP Advisor	0.13	0.16	124%
Legal Advisor to CCL	0.13	0.06	48%
Business Advisor to LTC	0.10	0.11	105%
Regulatory Advisory to LTA	0.20	0.20	99%
Support for setting up ICT unit in MoPT	0.22	0.13	61%
ICT Unit Manager	0.05	0.05	96%
Operationalizing ICT Unit	0.04	-	-

Training/Study Tour LTA	0.20	0.13	63%
Training/Study Tour MoPT	0.05	0.10	210%
CCL Station Manager	-	0.12	-
CCL Coaching Service	-	0.09	-
CCL Business Plan	-	0.08	-
CCL Demultiplexer	-	0.13	-
Supply of ICT Equipment to LTA	-	0.06	-
E-Justice - Supply of ICT Equipment	-	0.13	-
Updating Interconnection Tariff Model	-	0.04	-
Component 3 – Project Implementation	1.28	1.65	129%
PIU Coordinator	0.24	0.31	129%
PIU procurement specialist	0.20	0.27	133%
International Procurement Specialist	0.09	-	-
Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Support Staff	0.05	0.06	113%
Project Operations Manual	0.05	0.03	60%
ESMF and RPF	0.07	0.07	103%
EIA	0.08	0.04	53%
M&E	0.05	0.05	102%
Communications	0.08	0.08	108%
Office supply and computers	0.05	0.03	54%
Rent/operating costs	0.20	0.50	248%
PFMU Fee	0.14	0.19	144%
External Auditor	-	0.03	-
Total Baseline Cost	25.60	25.44	99%
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	25.60	25.44	
Front-end fee PPF	0.00	0.00	.00
Front-end fee IBRD	0.00	0.00	.00
Total Financing Required	25.60	25.44	

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		0.00	0.00	.00
International Development Association (IDA)		25.60	25.44	99%

Note: Based on PIU accounting records. Reallocation of funds between components and subcomponents was in line with WB support and through the projects two restructurings, including additional subcomponents under components 1 and 2 to address project needs. Increases in Component 3 (Project Implementation) arose due to the additional operating period allowed by the project's extension.

Annex 2. Sierra Leone Project Costs and Financing (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Component 1 – Improving Connectivity	26.750	27.85	104.3%%
Membership in ACE Cable	25.0	25.0	100%
Resettlement Cost	0.050	0.05	100%
Government Network –HW and SW	1.100	0	0%
TA for Government Network	0.200	0	0%
HW and SW for Emergency National Communications Network	0.200	0	0%
TA Support for SL Internet Exchange (SLXP)	0.200	0	0%
ICT Connect Schools and universities		1.1	100%
Component 2 – PPP, Enabling Environment and Institutional Strengthening	2.93	1.70	58%
PPP Design/Divestiture Govt Share in SALCAB	0.50	0.50	100%
Legal and regulatory safeguards for open access	0.35	0.35	100%
Revised Telecom Law, Related Regulatory Instruments	0.35	0.35	100%
Consultants to NATCOM, Strategy and Organizational Plan	0.20	0.20	100%
Support for Liberalization of Int Gateway	0.20	0.0	0%
Support for Privatization options Assessment for Sierratel	0.05	0.0	0%
Support for Privatization of Sierratel	0.40	0.0	0%
Training/Study Tour for NATCOM	0.30	0.1	33.3%
Training/Study Tour for MoIC	0.20	0.20	100%
Policy Advisor for MoIC (Directorate)	0.12	0.0	0%
Legal Advisor for MoIC (Directorate)	0.12	0.0	0%
Communications Strategy and Support	0.05	0.0	0%
Technical Assistance for Implementation of National ICT	0.09	0.0	0%
Component 3 – Project Implementation Support – incremental Operating Cost	1.32	1.45	110.5%
PIU Coordinator	0.17	0.17	100%
PIU procurement specialist	0.12	0.12	100%

PIU FM Specialist	0.12	0.12	100%
Project Operations Manual	0.03	0.12	100%
ESMF and RPF, EIA	0.07	0.07	100%
M&E	0.05	0.05	100%
PIU Set up and Operating Expenses	0.50	0.60	100%
SALCAB set up and operating expenses	0.2	0.2	100%
Support to the MoIC	0	0.05	100%
Audit	0.06	0	0%
Total Baseline Cost	31.00	31.00	100%
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	31.00	31.00	
Front-end fee PPF	0.00	0.00	.00
Front-end fee IBRD	0.00	0.00	.00
Total Financing Required	31.00	31.00	

Annex 3. Liberia Outputs by Component

Component	Activities	Outputs
Component 1 – Supporting Connectivity		
Improving international connectivity through funding access to ACE submarine cable and seed capital for a Universal Access Fund	Funding Liberia’s membership in the ACE submarine cable	<ul style="list-style-type: none"> Co-funding of Liberia’s consortium fee for the ACE Submarine Cable. The bulk of the project financing, this sub-component provided GoL’s share of the cost to participate in ACE, and was complemented by US\$ 5.0 million coming from private operators. Participation in ACE was the primary channel for achieving the PDO, greatly expanding Liberia’s access to international bandwidth. This membership fee provided for the ACE cable’s landing in Liberia, the construction of a landing station and its equipment, and the availability of broadband capacity through the cable.
	Seed capital for the establishment of a Universal Access Fund	<ul style="list-style-type: none"> A Universal Access Fund was established to support the roll-out of terrestrial broadband backbone fiber networks and last mile connectivity. IDA resources were contributed as seed capital to allow the fund to be established. The Universal Access Fund will leverage future private investment to reach rural parts of the country.
Component 2 – Creation of an Enabling Environment for Connectivity		
Provision of the technical assistance and capacity building necessary to support implementation of Component 1	Development of public private partnership frameworks	<ul style="list-style-type: none"> The project supported Liberia in establishing CCL, including providing for legal and financial advisory studies. Through these outputs, a shareholders’ agreement and articles of incorporation were drafted, and the CCL Board and management were established. This subcomponent also funded a study and on the eventual divestiture of GoL shares in CCL, including a business case and share valuation, a divestiture strategy and an information plan. Divestiture itself has not yet taken place. During implementation, it was determined that CCL did not have the necessary capacity to operate the landing station. In order to address this gap, the project provided funding for a CCL station manager, a coach to provide hands on training for landing station staff, and a demultiplexer to allow CCL to sell smaller units of capacity to local ISPs.
	Creating an enabling policy and regulatory environment	<ul style="list-style-type: none"> In order to ensure CCL and the sector as a whole operate on open and nondiscriminatory access principles, the subcomponent provided support for LTA to conduct its regulatory duty, including drafting and issuance of a license for CCL, revising regulations on interconnections, licensing, license fees, and other issues in the sector.
Component	Activities	Outputs
		<ul style="list-style-type: none"> In order to capitalize on the Universal Access Fund

		<p>seed capital provided for in component 1, the project supported the formulation of a Universal Access regime and the implementation of the Fund. This included a demand study, regulations for Universal Access, an Operations Manual for Universal Access, the creation of a Governing Board, and Implementation Committee and Implementation Unit.</p> <ul style="list-style-type: none"> • LTC, the national telecom incumbent operator, was supported through a study outlining options for a 5-year strategic repositioning in the market. Successfully repositioning LTC should improve the sector's enabling environment and overall competition. • A feasibility study was conducted on the potential deployment of a national telecommunications backbone for Liberia. The study covered the legal, regulatory and policy framework of such a backbone, the developmental and environmental impacts, technical design options, and a strategy for its implementation. This study has continued to inform Liberia's ongoing discussions on a phased roll-out of its terrestrial backbone infrastructure.
	Institutional strengthening of the telecom sector	<ul style="list-style-type: none"> • To support LTC's repositioning, a business advisor provided hands-on technical support, mentorship, analytical support, financial planning, and other advisory support. • To strengthen LTA's capacity to regulate the sector, advisory support was provided on defining the various telecom markets, regulating competition proceedings, and establishing competition guidelines. LTA was also supported in updating its Interconnection Tariff Model. • A e-Government office was established in the MoPT, including creation of a physical space and equipment in the MoPT, development of an Operations Manual, mentorship and training of staff, and hiring of a Manager. With the support of the project, this office developed and launched an e-Government web portal, and an e-Labor pilot application in the Ministry of
		<ul style="list-style-type: none"> • Labor. The project also provided ICT equipment for a e-Justice effort. • In order to strengthen the general regulation of the sector, 34 LTA staff were provided training on relevant topics. Trainings took the form of study tours, classes, and hands-on training and covered a wide range of topics, such as regulation strategy, radio spectrum monitoring, communications, impact analysis, and emerging technologies. LTA was also
Component	Activities	Outputs
		provided with ICT equipment in order to better

Support for project implementation	Establishing a Project Implementation Unit	<p>regulate the sector.</p> <ul style="list-style-type: none"> • To support the MoPT’s e-Government office, 55 staff from across the government were trained in the design and implementation of e-government policy. This included trainings in country for policy makers and IT staff from government agencies and ministries and a series of study tours by which senior MoPT officials visited and learned from similar initiatives in Rwanda and Ghana.
		<ul style="list-style-type: none"> • In order to deliver the project, a PIU was established within LTA. Support included hiring a PIU Coordinator, Procurement Specialist, M&E Specialist and other support staff. It also included communications, office supplies and computers, and communications. • The ESMF and EIA were covered through project funding. • An external auditor was hired to provide annual audits of project financial statements. • The PMFU provided FM support to the project throughout its life cycle, with its standard fee being covered through this subcomponent.

Annex 4. Sierra Leone Outputs by Components

Component	Activities	Outputs
Component 1 – Supporting Connectivity		
Improving international connectivity through funding access to ACE submarine cable and developing national connectivity	Funding Sierra Leone’ membership in the ACE submarine cable	<ul style="list-style-type: none"> Funding Sierra Leone’s consortium fee for the ACE Submarine Cable. The bulk of the project financing, this sub-component provided GoSL’s share of the cost to participate in ACE. Participation in ACE was the primary channel for achieving the PDO, greatly expanding Sierra Leone’s access to international bandwidth. This membership fee provided for the ACE cable’s landing in Sierra Leone, the construction of a landing station and its equipment, and the availability of broadband capacity through the cable.
	National Connectivity	<ul style="list-style-type: none"> The connectivity component provided connectivity to 10 MDAs, 10 schools and 10 universities. SALCAB provided the connectivity to the institutions through the ECOWAN network.
Component 2 – Creation of an Enabling Environment for Connectivity		
Provision of the technical assistance and capacity building necessary to support implementation of Component 1	Development of public private partnership frameworks	<ul style="list-style-type: none"> The project supported Sierra Leone to developed the design, ownership and management framework for SALCAB and the legal and financial framework. Through these outputs a MOU, shareholders’ agreement and amended and restated memorandum and articles of association were drafted, and the SALCAB Board and management were established. This subcomponent also funded a study on the divestiture of GoSL shares in SALCAB, including a divestiture and subscription agreement, business plan, and divestiture strategy. Divestiture took place in December 2012 however it was reversed after 7 months. 3 operators remain as shareholders but do not exercise any control and are required to buy wholesale capacity as customers. The GoSL plans to terminate the legal agreement. During implementation, it was determined that SALCAB would not have the necessary capacity to operate the landing station once ECOWAN was legally separated from them since they were providing the support at the time. In order to address this gap, the project provided temporary funding for two engineers.
	Creating an enabling policy and regulatory environment	<ul style="list-style-type: none"> In order to ensure SALCAB and the sector as a whole operate on open and nondiscriminatory access principles, the subcomponent provided support for NATCOM to develop a legal and regulatory framework under open access principles. This included drafting and issuance of a license for SALCAB, revising regulations on interconnections, tariffs licensing, license fees, and other issues in the

		<p>sector. The GoSL also published its action plan to liberalise the international gateway which was a legal covenant.</p> <ul style="list-style-type: none"> • The existing Telecommunications Act was amended to reverse Sierratel's monopoly over the international and internet gateway by revoking section 33. This was the second legal covenant.
Component	Activities	Outputs
		<ul style="list-style-type: none"> • NATCOM developed a medium term 5year strategic plan which is expected to support the sector's enabling environment and overall competition.
	Institutional strengthening of the telecom sector	<ul style="list-style-type: none"> • To strengthen NATCOM's capacity to regulate the sector, advisory, legal, regulatory and transaction support was provided by different experts to develop regulatory instruments. • MoIC prepared an e Government strategy which has been presented to cabinet. They set up an e Government office within their communications directorate.
		<ul style="list-style-type: none"> • Both NATCOM and MoIC benefitted from capacity building which included study tours, classes, and hands-on training and covered a wide range of topics, such as economic regulation, competition, licensing and quality of service.
Component	Activities	Outputs
Support for project implementation	Establishing a Project Implementation Unit	<ul style="list-style-type: none"> • In order to deliver the project, a PIU was established within MoIC. Support included hiring a PIU Coordinator, part time procurement consultant, M&E Specialist and other support staff. It also included communications, office supplies and computers, and communications. • The ESMF and EIA were covered through project funding. • An external auditor was hired to provide annual audits of project financial statements.

Annex 5. Economic and Financial Analysis for Liberia and Sierra Leone

Comparison of ACE with other options for international connectivity

At appraisal, the project documentation included a comparison of ACE with other options for international connectivity, and determined that ACE provided the best opportunity for Liberia and Sierra Leone to secure long term and reliable bandwidth at lower costs.

In general, it was determined that fiber options are the best overall option in terms of long-term cost effectiveness and bandwidth availability. While connecting through a new fiber link requires significantly more CAPEX than satellite (VSAT), over the long term, fiber was determined to offer the lowest price for connectivity, in addition to other long term benefits such as improved speed, and quality. The key expense driving the long term cost benefits is the cost of transit. For satellite, costs were estimated at \$2000 per month per Mbps. Fiber options were estimated at between \$230-\$800 per month per Mbps.

At the time of the WARCIP APL1-A, the ACE cable was determined to be the best fiber option for the two countries. The analysis indicated that, while offering lower upfront costs, connection to existing African cables or cross-border linkages to landing stations in neighboring countries would be significantly more expensive over the long term, with estimates of transit costs through the ACE cable reaching \$50-\$100 per month per Mbps.

Assumptions for analysis of satellite versus fiber optic cable

- Study period: 10 years
- Capital costs for ACE: 25m
- Initial capacity of ACE: 5.9 Gbps, using an average of 2.5 Gbps over the study period
- Annual operating and maintenance costs: 3% of CAPEX
- Cost for capacity on existing cables: MainOne and SAT-3: \$280-\$800 per month per Mbps
- Discount rate of 15%

Based on these assumptions, at appraisal it was calculated that Liberia and Sierra Leone would breakeven between 2015 and 2017 with an NPV by 2025 of US\$20.2 million.

Financial Analysis

The financial analysis was performed on CCL and SALCAB, with two areas of interest: (i) a historic analysis of the past 2010-2016 period; and (ii) a long-term period analysis to assess the financial sustainability of the project over the lifecycle of the asset (estimated at 20 years³⁰).

(i) 2010-2016 period – Over the 2010-2016 period, both SALCAB CCL have provided high-level financial statements summarizing the capital expenditures (CAPEX), operational expenditures (OPEX), gross revenues, and income tax.

³⁰ Lifecycle period based on other comparable projects.

Liberia

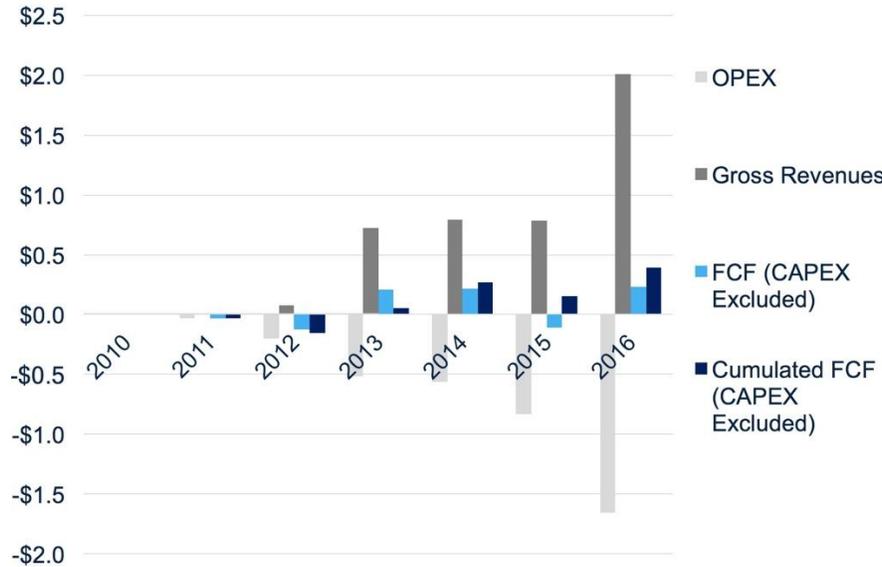
Figure 1: Financial statement provided by CCL (2010-2016, actual values, US\$)

Inputs	Unit	Act.	Act.	Act.	Act.	Act.	Act.	Act.
		2010	2011	2012	2013	2014	2015	2016
CAPEX								
CAPEX (Private)	\$	\$5,000,000						
CAPEX (Public)	\$		\$16,250,000	\$1,250,000				
CCL Operations and Maintenance OPEX								
Maintenance	\$				\$188,088	\$249,357	\$322,451	\$562,335
Energy	\$			\$25,000	\$156,579	\$153,642	\$154,119	\$181,975
Labor and Admin	\$		\$29,500	\$176,903	\$168,585	\$162,632	\$355,685	\$591,117
Other/Pyt to GoL & Libtelco	\$							\$316,301
CCL Revenue								
Data Transmission	\$					\$435,000	\$781,145	\$1,590,000
Other/Shareholder Contibution	\$			\$75,000	\$722,150	\$355,836		
Reimbursement from ACE	\$							\$407,460
Dark Fiber	\$							\$12,197
CCL Income Tax Paid								
Taxes Paid	\$					\$11,250	\$58,125	\$123,300

Based on the 2010-2016 financial statement provided by CCL, it appears that CCL is financially sustainable as it has covered its operational expenditures since 2013, the breakeven point, excluding capital expenditures - cumulated free cash-flow (FCF) excluding the capital expenditures has been positive since 2013.³¹

Figure 2: Gross revenues, OPEX, and FCF for CCL (2010-2016, million US\$)

³¹ Free Cash Flow is a measure a company's operating cash flow minus capital expenditure. It represents the cash the company is able to generate after expanding its asset base. It is used here to assess whether the SPV is sustainable over the life of the investment



However, the generated net revenues (defined here as the gross revenue minus the operational expenditures and the income tax) is not sufficient to cover the massive capital expenditures that were required to build the asset: over the 2010-2016 period the internal rate of return (IRR) of the project when considering only the private CAPEX is -38%, which confirms that the project could not have taken place without the assistance of public funds.

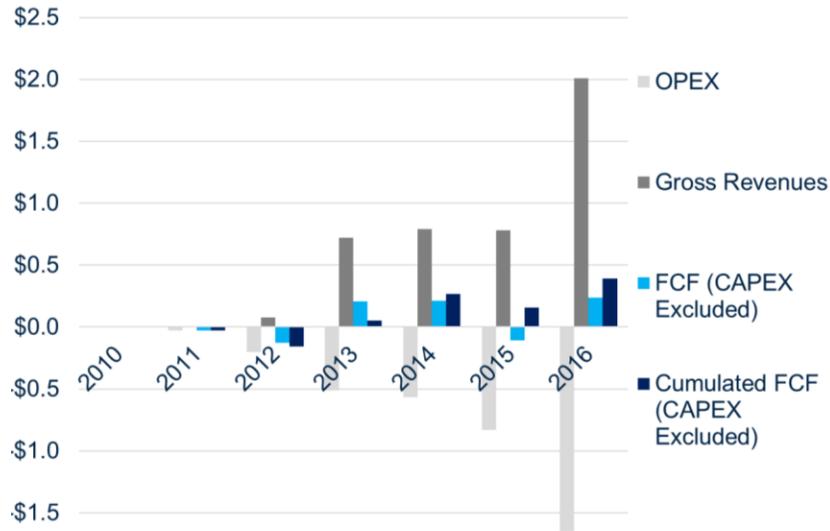
Sierra Leone

Figure 3: Financial statement provided by SALCAB (2010-2016, actual values, US\$)

Inputs	Unit	Act. 2010	Act. 2011	Act. 2012	Act. 2013	Act. 2014	Act. 2015	Act. 2016
CAPEX								
CAPEX (Private)	\$							
CAPEX (Public, in ACE)	\$	\$2,500,000	\$13,000,000	\$8,250,000	\$1,250,000			
SALCAB Operations and Maintenance OPEX								
Maintenance	\$				\$822,523	\$400,514	\$309,562	\$275,443
Energy	\$				\$120,905	\$155,329	\$88,119	\$107,807
Labor and Admin (including depreciation)	\$				\$593,483	\$997,966	\$854,310	\$1,255,742
Other (including in national backbone)	\$					\$136,670	\$343,274	\$2,506,071
SALCAB Revenue								
Data Transmission	\$					\$3,623,957	\$3,779,443	\$4,578,420
Other/Shareholder Contibution	\$				\$951,494	\$225	\$1,081	\$1,488,884
Reimbursement from ACE	\$				\$659,901	\$116,552		
SALCAB Income Tax Paid								
Taxes Paid	\$				\$22,730	\$56,467	\$443,309	\$236,366

Based on the 2010-2016 financial statement provided by SALCAB, it appears that SALCAB is financially sustainable as it has covered its operational expenditures since 2014, the breakeven point, excluding capital expenditures - cumulated free cash-flow (FCF) excluding the capital expenditures has been positive since 2014.

Figure 4: Gross revenues, OPEX, and FCF for SALCAB (2010-2016, million US\$)



However, as with Liberia, the generated net revenues (defined here as the gross revenue minus the operational expenditures and the income tax) are not sufficient to cover the massive capital expenditures that were required to build the asset: over the 2010-2016 period the internal rate of return (IRR) of the project when considering overall CAPEX is -35%, which confirms that the project could not have taken place without the assistance of public funds.

(ii) 2010-2029 period – The financial analysis over the 20-year asset lifecycle requires estimation of revenues, OPEX, and taxes for the 2017-2020 period.³² As no forecast of financials are available, the analysis was based on the following assumptions:

Evolution of gross revenues – The evolution of gross revenues (in real prices) is estimated based on the forecasts of the GDP growth by the International Monetary Fund (IMF) provided for 2017-2021³³. For the remaining years, the GDP growth is considered equal to 2021.³⁴

Evolution of OPEX – The evolution of OPEX is estimated as a percentage of the total gross revenues. The percentage is set equal to the average of the last three years of available data (2014-2016).

Evolution of taxes – The evolution of taxes is estimated as a percentage of the total gross revenues minus the OPEX. The percentage is set equal to the last available figure for the year 2016 overall percentage of the last three years of available data.

Based on these assumptions, the 2010-2029 financial results are the following:

³² Replacement and maintenance costs are included in the OPEX portion of the analysis, with no CAPEX subsequent to the initial investment required through the 20-year asset lifecycle.

³³ IMF, World Economic Outlook Database, October 2016 ([Link](#)).

³⁴ As it may be overly optimistic to assume GDP growth remains at 2021 projected levels (7.3%) through 2021, a sensitivity analysis was performed on the calculations to determine the importance of this assumption on the overall calculated IRR, with results showing only a small impact. While the factor used is based on the best a cross country assessment available, in Liberia and Sierra Leone where the digital ecosystem is still so nascent, this may be a somewhat optimistic approach. Despite this uncertainty, it is clear from available research that the impact is significant and positive.

Liberia

IRR when considering only the private CAPEX is 1%, which ensures that the private sector does not benefit from an undue profit from the funds provided by the public sector. The break-even point is 2028.

IRR when considering the total CAPEX is -10%, which confirms that the project could not have taken place without the assistance of public funds.

Figure 5: Financial analysis of CCL (actual and estimated values, 2010-2029)

FCF	Unit	Act.	Act.	Act.	Act.	Act.	Act.	Act.	Est.												
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Gross Revenues	\$m	0.0	0.0	0.1	0.7	0.8	0.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.5	3.7	4.0	4.3	4.6	5.0	5.3
OPEX	\$m	0.0	(0.0)	(0.2)	(0.5)	(0.6)	(0.8)	(1.7)	(1.9)	(2.1)	(2.2)	(2.4)	(2.6)	(2.8)	(3.0)	(3.2)	(3.5)	(3.7)	(4.0)	(4.3)	(4.6)
Taxes	\$m	0.0	0.0	0.0	0.0	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
FCF (CAPEX Excluded)	\$m	0.0	(0.0)	(0.1)	0.2	0.2	(0.1)	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
Cumulated FCF (CAPEX Excluded)	\$m	0.0	(0.0)	(0.2)	0.1	0.3	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.3	2.7	3.1	3.6	4.1	4.6	5.2	5.8
CAPEX (Private)	\$m	(5.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPEX (Public)	\$m	0.0	(16.3)	(1.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCF (Private CAPEX Included)	\$m	(5.0)	(0.0)	(0.1)	0.2	0.2	(0.1)	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
Cumulated FCF (Private CAPEX Included)	\$m	(5.0)	(5.0)	(5.2)	(4.9)	(4.7)	(4.8)	(4.4)	(4.4)	(4.1)	(3.8)	(3.5)	(3.1)	(2.7)	(2.3)	(1.9)	(1.4)	(0.9)	(0.4)	0.2	0.8
FCF (Total CAPEX Included)	\$m	(5.0)	(16.3)	(1.4)	0.2	0.2	(0.1)	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
Cumulated FCF (Total CAPEX Included)	\$m	(5.0)	(21.3)	(22.7)	(22.4)	(22.2)	(22.3)	(22.1)	(21.9)	(21.6)	(21.3)	(21.0)	(20.6)	(20.2)	(19.8)	(19.4)	(18.9)	(18.4)	(17.9)	(17.3)	(16.7)

Ratio and indicators	Unit	Act.	Act.	Act.	Act.	Act.	Act.	Act.	Est.												
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
GDP Growth (current prices, US\$)	%	19.2%	13.4%	12.4%	2.5%	1.1%	6.6%	7.7%	9.3%	9.2%	9.2%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%
OPEX/Gross Revenues	%	0%	0%	269%	71%	72%	107%	82%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%
Tax rate (% Operating Income)	%	--	0%	0%	0%	5%	-114%	34%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%

2010-2016 Period

Average OPEX rate over the period	87%
Average tax rate over the period	33%

2010-2016 IRR

IRR (CAPEX Excluded)	83%
IRR (Only Private CAPEX Included)	-38%
IRR (Total CAPEX Included)	-59%

2010-2029 IRR

IRR (CAPEX Excluded)	95%
IRR (Only Private CAPEX Included)	1%
IRR (Total CAPEX Included)	-10%

Sierra Leone

IRR, considering the total CAPEX is 2%, which, while positive, is so low as to confirm that the project would likely not have taken place without the assistance of public funds.

Figure 6: Financial analysis of CCL (actual and estimated values, 2010-2029)

FCF	Unit	Act.	Act.	Act.	Act.	Act.	Act.	Act.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.	Est.
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Gross Revenues	\$m	0.0	0.0	0.0	1.6	3.7	3.8	6.1	3.7	4.0	4.4	4.8	5.2	5.5	5.9	6.4	6.8	7.3	7.9	8.5	9.1
OPEX	\$m	0.0	0.0	0.0	(1.5)	(1.7)	(1.6)	(4.1)	(2.3)	(2.5)	(2.8)	(3.0)	(3.2)	(3.5)	(3.7)	(4.0)	(4.3)	(4.6)	(4.9)	(5.3)	(5.7)
Taxes	\$m	0.0	0.0	0.0	(0.0)	(0.1)	(0.4)	(0.2)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	
FCF (CAPEX Excluded)	\$m	0.0	0.0	0.0	(0.6)	1.9	1.7	1.7	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.1
Cumulated FCF (CAPEX Excluded)	\$m	0.0	0.0	0.0	(0.6)	1.3	3.0	4.7	6.0	7.3	8.8	10.5	12.2	14.1	16.1	18.3	20.7	23.2	25.8	28.7	31.8
CAPEX (Private)	\$m	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPEX (Public)	\$m	(2.5)	(13.0)	(8.3)	(1.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCF (Private CAPEX Included)	\$m	0.0	0.0	0.0	(0.6)	1.9	1.7	1.7	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.1
Cumulated FCF (Private CAPEX Included)	\$m	0.0	0.0	0.0	(0.6)	1.3	3.0	4.7	6.0	7.3	8.8	10.5	12.2	14.1	16.1	18.3	20.7	23.2	25.8	28.7	31.8
FCF (Total CAPEX Included)	\$m	(2.5)	(13.0)	(8.3)	(1.9)	1.9	1.7	1.7	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.1
Cumulated FCF (Total CAPEX Included)	\$m	(2.5)	(15.5)	(23.8)	(25.6)	(23.7)	(22.0)	(20.3)	(19.0)	(17.7)	(16.2)	(14.5)	(12.8)	(10.9)	(8.9)	(6.7)	(4.3)	(1.8)	0.8	3.7	6.8

Ratio and indicators	Unit	Act. 2010	Act. 2011	Act. 2012	Act. 2013	Act. 2014	Act. 2015	Act. 2016	Est. 2017	Est. 2018	Est. 2019	Est. 2020	Est. 2021	Est. 2022	Est. 2023	Est. 2024	Est. 2025	Est. 2026	Est. 2027	Est. 2028	Est. 2029
GDP Growth (current prices, US\$)	%		19.2%	13.4%	12.4%	2.5%	1.1%	6.6%	7.7%	9.3%	9.2%	9.2%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%
OPEX/Gross Revenues	%	0%	0%	0%	95%	45%	42%	68%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
Tax rate (% Operating Income)	%	--	--	--	31%	3%	18%	5%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%

2010-2016 Period	
Average OPEX rate over the period	59%
Average tax rate over the period	12%

2010-2016 IRR	
IRR (CAPEX Excluded)	298%
IRR (Total CAPEX Included)	-35%

2010-2029 IRR	
IRR (CAPEX Excluded)	302%
IRR (Total CAPEX Included)	2%

Economic Analysis: impact on GDP growth

According to World Bank research, each 10 percentage point increase in broadband penetration increases overall GDP growth in developing countries by 1.38 percentage points³⁵. The lower costs and improved capacity provided by the landing of the ACE cable substantially increased broadband penetration in the countries, with the most dramatic increase coming in the year following the landing station initiating services (mobile broadband rates increased from 3.7% to 24% in Liberia, and 3.1% to 18% in Sierra Leone). While some mobile broadband service was available prior to the project, the scale changed dramatically. In order to estimate the project's impact on GDP, both during the life of the project and projected through 2022, mobile broadband penetration rates were estimated with and without the project. Broadband penetration rates were calculated based on a linear increase in line with growth over the last three years (since ACE went into operation in both countries). Assumed penetration without the project were calculated assuming a linear increase based on the three years prior to the operation of ACE in Liberia (with a similar increase assumed in Sierra Leone). Based on this analysis, by the end of 2016 the project had contributed more than \$300 million to Liberia's economy and nearly \$1 billion to that of Sierra Leone. Projecting to 2022 (the last year that GDP estimates are available), the yearly impact on GDP will reach \$650 million in Liberia, and \$1.6 billion in Sierra Leone.

³⁵ Qiang, Christine Zhen-Wei, Carlo M. Rossoto, and Kaoru Kimura. 2009. "Economic Impacts of Broadband." In *Information and Communications for Development 2009: Extending Reach and Increasing Impact*, chap. 3. World Bank.

Figure 7: GDP impact of the WARCIP project

Impact on Liberia	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Mobile Broadband Penetration	1.5%	2.6%	3.7%	24.1%	27.1%	30.8%	33.0%	35.2%	37.4%	39.6%	41.9%	44.1%
without WARCIP project	1.5%	2.6%	3.7%	4.8%	5.9%	7.1%	8.2%	9.3%	10.4%	11.5%	12.6%	13.7%
GDP % change, constant prices	7.4%	8.2%	8.7%	0.7%	0.0%	-1.6%	2.6%	4.0%	5.0%	6.0%	6.3%	6.8%
of which due to mobile broadband penetration	0.2%	0.4%	0.5%	3.3%	3.7%	4.2%	4.6%	4.9%	5.2%	5.5%	5.8%	6.1%
of which due to WARCIP project	0.0%	0.0%	0.0%	2.7%	2.9%	3.3%	3.4%	3.6%	3.7%	3.9%	4.0%	4.2%
GDP, constant prices (US\$ billions, 2011)	1.54	1.67	1.81	1.82	1.82	1.79	1.84	1.91	2.01	2.13	2.26	2.42
without mobile broadband	1.54	1.66	1.80	1.75	1.68	1.59	1.55	1.54	1.54	1.54	1.55	1.57
without WARCIP project	1.54	1.67	1.81	1.78	1.72	1.64	1.63	1.63	1.65	1.69	1.73	1.77
GDP associated with impact of project	0.00	0.00	0.00	0.05	0.10	0.16	0.22	0.28	0.36	0.44	0.54	0.65

Figure 8: GDP impact of the WARCIP project

Impact on Sierra Leone	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Mobile Broadband Penetration	0.3%	3.1%	18.0%	23.0%	28.0%	32.0%	35.0%	37.3%	39.1%	40.5%	41.5%	42.3%
without WARCIP project	0.3%	1.4%	2.5%	3.6%	4.7%	5.8%	6.9%	8.0%	9.1%	10.2%	11.3%	12.4%
GDP % change, constant prices	6.3%	15.2%	20.7%	4.6%	-20.5%	6.1%	6.0%	6.1%	6.8%	6.8%	7.1%	7.4%
of which due to mobile broadband penetration	0.0%	0.4%	2.5%	3.2%	3.9%	4.4%	4.8%	5.2%	5.4%	5.6%	5.7%	5.8%
of which due to WARCIP project	0.0%	0.2%	2.1%	2.7%	3.2%	3.6%	3.9%	4.1%	4.1%	4.2%	4.2%	4.1%
GDP, constant prices (US\$ billions, 2011)	2.94	3.39	4.09	4.28	3.40	3.61	3.82	4.06	4.33	4.63	4.95	5.32
without mobile broadband	2.94	3.38	3.99	4.05	3.06	3.11	3.15	3.18	3.22	3.26	3.31	3.36
without WARCIP project	2.94	3.38	4.01	4.08	3.12	3.19	3.26	3.33	3.42	3.50	3.61	3.72
GDP associated with impact of project	0.00	0.01	0.08	0.19	0.28	0.41	0.56	0.73	0.92	1.12	1.35	1.60
Total GDP associated with Project (both countries)	0.00	0.01	0.08	0.19	0.28	0.41	0.56	0.73	0.92	1.12	1.35	1.60

Source: Projected GDP based on IMF World Economic Output Database. Broadband Penetrations rates based on project data. All calculations by author

A comparison with similar countries indicates that this is likely a conservative approach, with mobile broadband penetration likely to accelerate as prices of service continue to fall due to capacity expansion and technological advances. It also discounts the impact of the Ebola crisis on the last several years of service, which may have slowed the roll out of mobile broadband service in some areas. In addition, assuming that penetration rates without the project would continue to increase linearly discounts the impact of the technical assistance provided through component 2, which supported a competitive telecom sector and associated decreases in prices, and assumes satellite based service could be expanded linearly.

Figure 9: Liberia Projected GDP, mobile broadband rollout scenarios

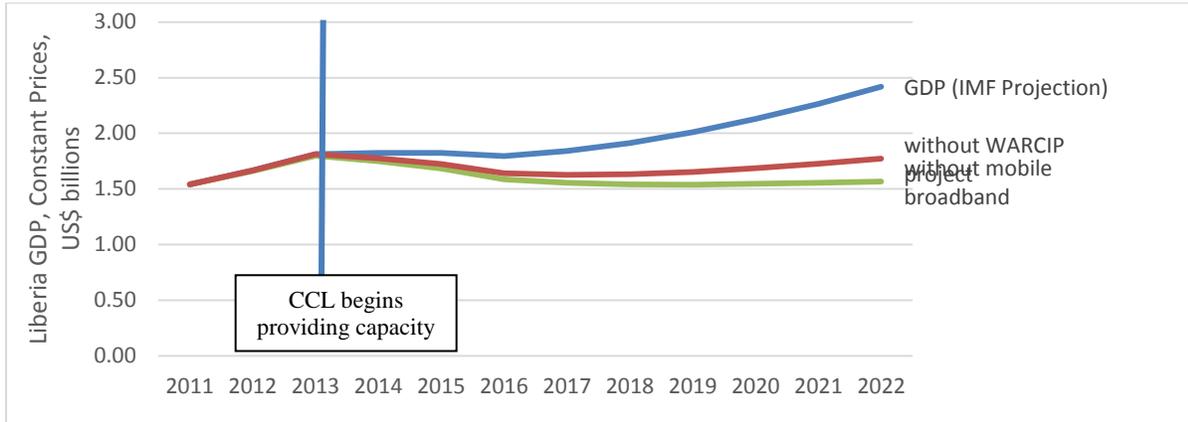
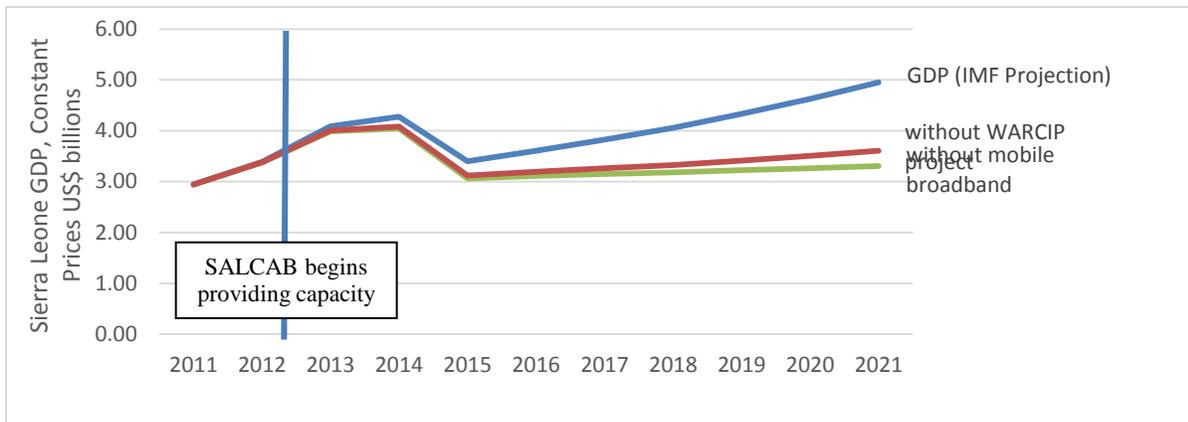


Figure 10: Sierra Leone Projected GDP, mobile broadband rollout scenarios



Based on this impact on GDP, it is calculated that the project’s NPV through 2021 is \$538 million in Liberia and \$1.5 billion in Sierra Leone (assuming a discount rate of 15%), for a total NPV of just over \$2 billion for the overall project. This serves to underscore the significant potential impact of unlocking the telecom sector, an impact which has been found in other developing countries.

Annex 6. Summary of Borrower's ICR and/or Comments on Draft ICR for Liberia

From: aweeks@lta.gov.lr [mailto:aweeks@lta.gov.lr]

Sent: Friday, March 24, 2017 3:45 PM

To: Zaid Safdar <zsafdar@worldBank.org>

Cc: 'Blidi Elliott' <blidielliott@gmail.com>; Adam Stone Diehl <adiehl@worldBank.org>; Michele Ralisoa Noro <mralisoanoro@worldBank.org>; Ida S Mboob <imboob@worldBank.org>; Chair <angelique.weeks@gmail.com>

Subject: RE: Liberia WARCIP - Draft Implementation Completion Report for Review

Dear Zaid:

Please accept my apologies for the delayed feedback. I traveled out of country for a medical trip and returned this week. Regarding the draft Implementation Completion Report, I am pleased to feedback as follows:

The Bank's ICR to a large extent adequately assesses the performance and outcomes of the WARCIP Liberia Project. We are, however, concerned that Liberia would have achieved a higher rating in Part G "Rating of Project Performance in ICRs" and in Part I "Disbursement Profile", had Liberia's performance been assessed individually instead of in combination with other WARCIP projects. We would appreciate clarity from the Bank.

Thanks and kind regards, CHAIR-----→A.

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Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR for Sierra Leone

From: Munda Sowa [<mailto:mundasowa3@yahoo.com>]

Sent: Monday, December 18, 2017 11:16 AM

To: Ida S Mboob <imboob@worldBank.org>

Subject: Re: ICR comments

The Ministry acknowledges the WARCIP-SL implementation report as well as the issues highlighted.

The focus of the WARCIP-Sierra Leone was to contribute to addressing connectivity gap at national and international level that will enable creation of a fully integrated network and provide affordable high speed links. The project also aim at assisting the GOSL in improving good governance, transparency and accountability of key public institutions.

Despite the challenges during the implementation, WARCIP has positively impacted Sierra Leone as we are now reliably connected to rest of the world through the ACE submarine cable. We are now seeing the resultant effect of the project through an expanded geographic reach for broadband connectivity. We have been able to take the Fibre Cable to about 50% of our district headquarter towns as well as passing through major population areas through the ECOWAN and HUAWEI projects.

The implementation of this project and other related ICT projects over the years has been a learning experience for both the Ministry and the Government. We are taking onboard measures to address these challenges and better prepare ourselves for the design and implementation of future ICT projects. The Ministry is in the process of creating an Integrated Project Management Unit that will be charged with the responsibility of managing all future ICT related projects under the Ministry. This we believe will greatly improve our oversight and supervision responsibilities.

You would agree with me that at the time of design of the WARCIP project, the capacity by way of personnel in the Ministry was lacking. The Ministry now has a well staff Professional wing with an eGovernment Units as a Policy and Cyber Security Units.

We look forward to the finalization of this report and phase 2 of the project.

Thanks

Brima

PS

WARCIP
LIBERIA

Implementation Completion Report



September 2016

REPUBLIC OF LIBERIA



LIBERIA TELECOMMUNICATIONS AUTHORITY

**West Africa Regional Communications Infrastructure Program
Liberia Project**

Implementation Completion Report

September 2016

Cover Photo: Children of the PHP Community at ACE landing © Heidi Sheppard

REPUBLIC OF LIBERIA
WARCIP Liberia
Implementation Completion Report

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1.0 PROJECT DATA

A. Basic Information			
Country:	Liberia	Project Name:	WARCIP Liberia
Project ID:	P116273	L/C/TF Number:	IDA 48550
ICR Date:	09/30/2016	ICR Type:	Borrower Core ICR
Lending Instrument:	APL	Borrower:	LIBERIA
Total Commitment:	US\$25.6M	Disbursed Amount:	US\$25.4M
Environmental Category:	C		
Implementing Agency:	Liberia Telecommunications Authority (LTA)		
Co-financiers:	None		

B. Key Dates				
Process	Date	Process	Original Date	Revised/Actual Dates
Concept Review:	06/8/2008	Effectiveness:		06/13/2011
Appraisal:		Restructuring:		09/30/2015 03/30/2016
Approval:	01/20/2011	Mid-Term Review:		12/16/2013
		Closing:	09/30/2015	09/30/2016

2.0 RELEVANCE OF OBJECTIVES, DESIGN AND IMPLEMENTATION

2.1 Relevance of Project Objectives

The Project objectives remain consistent with the current development strategies of the Government of Liberia (GoL), the sector policy that informs those strategies, and with the World Bank's *Liberia Country Partnership Strategy (FY 13 – FY 17)*.

The Project's Development Objective (PDO) is clearly aligned with the GoL's *Agenda for Transformation (AfT)*, a medium term strategy for poverty reduction, sustained growth and inclusive prosperity. A key component of the AfT is "Economic Transformation" which seeks to transform and diversify the country's economy through, among other activities, improved energy, transportation and telecommunications infrastructure. The AfT specifies the following strategic objectives for telecommunications – to facilitate universal access, transparency and reliability of low-cost telecommunications and ICT services, and to upgrade domestic and international internet connectivity.

Underpinning these strategies is the country's Telecommunications and ICT Policy (2010 - 2015) which has the objective of developing telecommunications infrastructure to support the deployment of ICT services.

The Bank's Country Strategy, in support of the GoL's AfT and the GoL's longer term development plan *Liberia Rising 2030*, accepts that developing basic infrastructure is "necessary for enhancing growth, connecting people, uniting a nation, and reducing fragility". The Country Strategy, recognizing that the "connectivity gap in telecommunications remains large" despite growth in mobile density, suggests that additional investment would be needed in telecommunications infrastructure, ICT and demand stimulation to bridge the access gap¹.

The Project's objectives continue to be relevant to the country's development priorities and strategies.

2.2 Relevance of Project Design

The Project's components and activities have proven to be robust in achieving the objectives of increasing the reach and reducing the cost of telecommunications services in Liberia.

The Project has three components – 1) Infrastructure component to improve connectivity 2) Technical assistance component to engender an enabled environment to support connectivity, and 3) Implementation support component.

Activity under the infrastructure component financed Liberia's membership of the Africa Coast to Europe (ACE) consortium, allowing the country to connect for the first time to low-cost, high volume international broadband capacity via the ACE sub-sea fiber optic cable. Financing under this component also supported the construction and equipping of the ACE cable landing station in Liberia. Connecting the country to the low-cost international broadband network is perhaps the single most important activity of the Project in achieving its objectives.

¹ Liberia Country Partnership Strategy (FY 13 – FY 17), page 11

In addition to the supply of international broadband capacity, the Project design included, under Component 2, the legal, regulatory and transactional support to ensure a conducive telecommunications environment. Activities under Component 2 remain consistent with Project objectives by supporting establishment of the Cable Consortium of Liberia (CCL) a Special Purpose Vehicle formed as a Public Private Partnership to own and manage the ACE cable landing in Liberia. Other key activities under this component supported the development of regulatory instruments to ensure open access to the ACE capacity, an improved licensing and interconnection framework for the telecommunications sector, development of regulations and guidelines for the establishment of a universal access fund, and technical studies on the roll-out of a terrestrial broadband backbone network to increase access to broadband capacity.

The logic of the Project design can be seen in the clear linkage between the activities, the outputs and outcomes as delineated in the causal chain at Table 1.

2.3 Relevance of Project Implementation

Support for new activities during implementation is evidence of the flexibility of implementation in adjusting to changed circumstances in order to maintain relevance and consistency with objectives. The decision during implementation to provide support to CCL in addition to the originally intended ACE membership fee and PPP transactional design, is an example of continuing relevance of implementation, as without the additional intervention, there may have been increased risk of CCL being unable to manage and maintain the landing station or provide competitive access to the ACE capacity.

The Project provided a technical coach to improve the hands-on capacity of the CCL technical staff to effectively operate and maintain the landing station; technical assistance to develop a business plan for the sustainability of the CCL land station; and procurement, installation and training for a demultiplexer to ensure open access to ACE capacity by smaller service providers.

Relevance of implementation is also evidenced by adjustments to capacity building programs for the telecommunications regulator and the policy maker by directing resources towards in-country training and study tours for large numbers of staff rather than overseas seminars for individuals as originally designed.

Implementation support for the revision of the telecommunications interconnection tariff model and implementation of e-government pilot projects are further examples of changes in scope that maintained the relevance of implementation in achieving the Project objectives.

3.0 ACHIEVEMENT OF PROJECT DEVELOPMENT OBJECTIVES

The Project Development Objectives (PDO) are to increase the geographical reach of broadband networks and reduce the costs of communications services in Liberia.

There is evidence from the Results Framework and other monitoring sources that the price of wholesale and retail services has dropped, access to voice and data services has increased, and telecommunications networks have increased their penetration and geographical coverage. For most indicators, the Project exceeded final targets, where for other indicators, final results far out-strip baseline values.

3.1 Project Causal Chain

Causal Chain	
Outcomes 	<ul style="list-style-type: none"> ○ Reduced cost of communications services ○ Increased reach of broadband networks
Intermediate Outcomes 	<ul style="list-style-type: none"> ○ ACE Broadband capacity managed under Open Access principles ○ 2,950,000 direct project beneficiaries (66% of population) ○ 30.78% of population with access to internet services ○ 84.57% of population with access to telephone services ○ Retail price of internet services falls to \$400/Mb/month ○ Wholesale price of international E1 capacity falls to \$750/month ○ Strengthened capacity of telecoms regulator and policy maker for a more predictable legal and regulatory environment
Outputs 	<ul style="list-style-type: none"> ○ ACE fiber optic cable landed in Liberia ○ Landing station constructed & equipped ○ Available low cost broadband capacity of 400 STM-1s ○ CCL shareholders' agreement ○ Functioning CCL Board and management team ○ CCL License ○ Revised Interconnection Regulation ○ Revised Licensing Regulation ○ License Fee Regulation ○ Price Cap Decision on CCL ○ CCL Business Plan ○ Technical Design, Implementation Strategy, Business & Financing Model for the Backbone ○ Universal Access Regulations, Operations Manual, and set-up of UA Governing Board ○ Establishment of e-Government Projects Management Office at MoPT ○ Competition Regulations and Guidelines ○ Divestiture implementation strategy and plan
Inputs	<ul style="list-style-type: none"> ○ Financing of ACE membership fee ○ Technical assistance to develop CCL PPP structure ○ Technical assistance for regulatory & policy reform ○ Capacity building for regulatory & policy institutions ○ Technical assistance to develop Universal Access regime ○ Technical assistance for divestiture of GoL from CCL ○ Technical assistance to conduct a Backbone feasibility study ○ Technical assistance for an assessment of competition ○ Technical assistance to establish an e-government program ○

Table 1: Project Causal Chain

3.2 Increasing the Reach of Broadband Networks

The results framework assessed the reach of networks by measuring the access of the population to telephone and internet services. Access to internet services, a core indicator, shows 30.78% of the population with access to internet, with greater than 1000% growth of internet penetration over the baseline value of 1.5% of the population, and far exceeding the 3% final target established at Project inception.

Another core indicator measuring the extent of reach of broadband – the number of people with access to telephone services – shows that 85 out of every 100 persons in Liberia has access to telephone services, indicating growth of 250% over the baseline value of 24 out of every 100 persons with telephone access. The final target of 47% of the population with access to telephone services was surpassed well before Project completion.

The third core PDO indicator – the number of direct project beneficiaries – also provides evidence of the extent to which the population has experienced increased access to broadband services as a direct result of the Project's intervention. Direct project beneficiaries are defined in the Project Appraisal Document as the citizens of Liberia as a whole, but for M&E purposes, the Project has restricted direct beneficiaries to mean active individual and business users of telecommunications networks. The results observed for this indicator show beneficiary growth of 321% over the baseline of 700,000 persons.

There is a direct linkage between the increase in the population's access to communications services and the increased availability of capacity, as measured by the intermediate indicator assessing the volume of available international broadband capacity.

Figures 1 and 2 provide graphical representations of the achievement of the objective of increasing the reach of broadband networks.

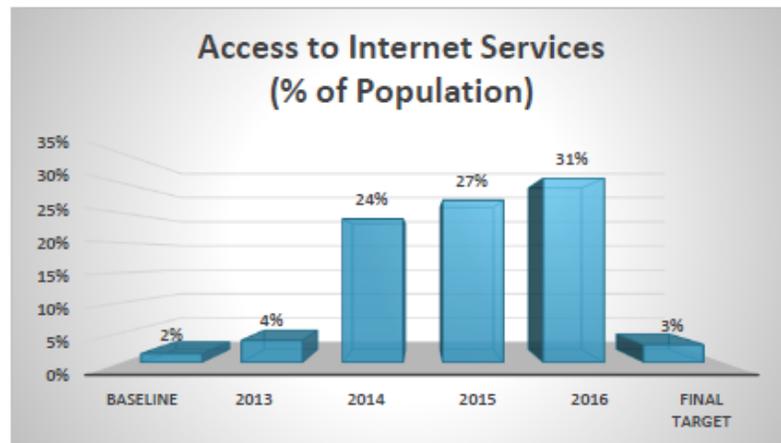


Figure 1: Access to Internet Services

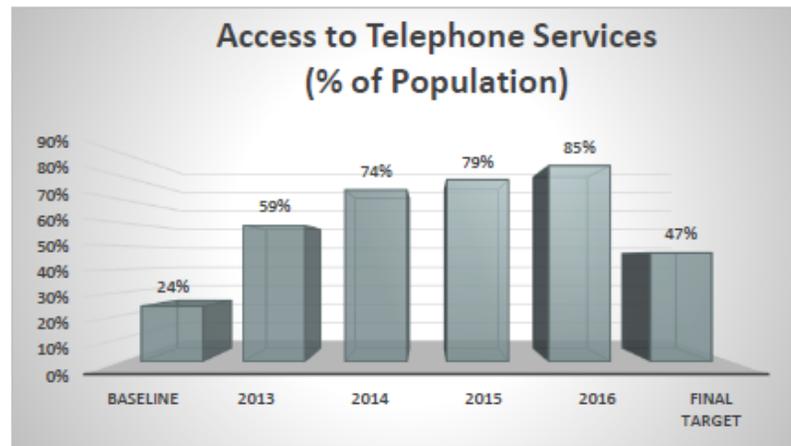


Figure 2: Access to Telephone Services

3.3 Reducing the Cost of Communications Services

Two results framework indicators tracked the cost of wholesale and retail services. The PDO indicator “average monthly price of wholesale international E1 capacity” assessed the wholesale cost of providing telecommunications services, while the intermediate indicator “retail price of internet services” assessed the retail price of data services.

As a direct result of the Project’s intervention, the wholesale cost of communications services reduced from the baseline value of \$8,000 to \$750 for an E1 (2Mb/s) capacity link from Monrovia to Europe, while the retail price of internet services reduced from \$1,200 to \$400 for 1Mb/s.

The drop in the wholesale price has led to a corresponding reduction in the price for retail services which has in turn spurred demand and increased the reach of broadband services.

Figures 3 & 4 graph the reduction in prices of retail and wholesale services.

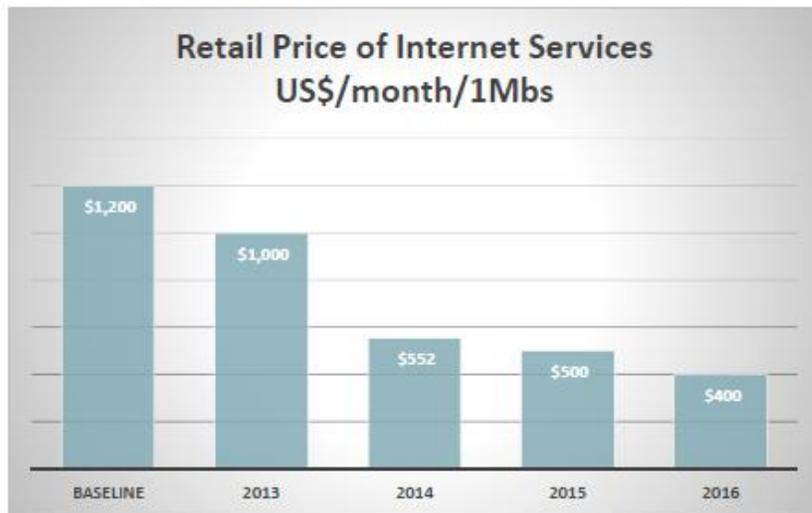


Figure 3: Retail Price of Internet Services



Figure 4: Wholesale Price of International Capacity

3.4 Causal Chain Analysis

The causal chain in Table 1 provides evidence that the achieved objectives/outcomes of the Project can be directly attributed to Project activities. These activities and outputs are broadly discussed below, with more detailed discussion of outputs by component in Annex 1.

3.4.1 Component 1: International Connectivity

The principal activity under this component was the financing of Liberia's membership in the Africa Coast to Europe (ACE) consortium, a sub-sea fiber optic cable linking countries along the west coast of Africa to Europe. This activity resulted in the connection of the country, for the first time, to the global broadband fiber optic network, providing access to a lower cost and a higher volume of bandwidth for more effective global communications. The connection to ACE is perhaps the single most important output of the Project – providing the supply of broadband capacity to stimulate lower costs for communications and extension of the reach of communications.

3.4.2 Component 2: Creating a PPP Framework and Enabling Environment

Activities under this component supported the development of a public private partnership through a special purpose vehicle (the Cable Consortium of Liberia) for owning and managing the ACE cable landing under open access principles. The PPP was established with the GoL (60%), Libtelco (20%) and private service providers Lonestar/MTN (10%) and Cellcom (10%). A smaller private operator, Novafone, later acquired 5% of GoL's shareholding in CCL.

As further evidence of the increased availability of international broadband capacity and the increasing demand among the population, all capacity originally allocated to private operators and Libtelco has been utilized, with private operators leasing an additional 2 STM-1s from GoL's allocation. Table 2 illustrates the allocated, used and available capacity as at May 2016.

Shareholder	Allocated Capacity	Capacity in Use	Available Capacity	MIU
GoL	24 x STM-1	2	22	104,962
Cellcom	3 x STM-1	3	0	14,313
Lonestar/MTN	3 x STM-1	3	0	14,313
Libtelco	6 x STM-1	6	0	28,626
Novafone	1.5 x STM-1	1.5	0	7,157
CCL Pool	4.5 x STM-1	3.5	1	21,469

Table 2: CCL International Capacity Usage (Source: CCL, May 2016)

Other activities under Component 2 included legal and regulatory support for improved connectivity, which resulted in the development of the following regulatory instruments and studies to improve the capacity of regulatory authorities to effectively regulate the changed telecommunications environment brought about by the landing of the ACE cable:

1. Analysis of the Liberia telecommunications market leading to the imposition of price caps on CCL;
2. Revised Interconnection Regulations to make them more appropriate to the changed market conditions following the ACE landing;
3. Revised Licensing Regulations to include provisions for a performance based licensing regime to ensure consistency with the ECOWAS regulatory framework, to remedy inconsistencies in the 2008 Licensing Regulations, and to provide an enhanced licensing framework in the context of a license for CCL;
4. A License Fee Regulation identifying the types of licenses, specifying the processes and procedures for license acquisition and renewal, and specifying fees and penalties in complement to the Revised Licensing Regulations;
5. A Radio Spectrum Action Plan to improve radio spectrum management;
6. A Business Plan for the Cable Consortium of Liberia to sustain the operation and management of the ACE landing station;
7. Regulations for Competition Proceedings to establish the procedures for interactions between and among the regulator and service providers regarding competition-related provisions of the Telecommunications Law;
8. Competition Guidelines establishing the procedures and principles to be applied by the regulator in reviewing competitive conditions in telecommunications markets;
9. Imputation Test Guidelines setting out the principles and procedures to be followed by the regulator in determining market dominance of vertically integrated service providers and augmenting the Competition Guidelines.

Additional outputs of this component intended to support the achievement of the desired outcomes of increased reach and reduced cost of telecommunications services include:

1. A Strategic Plan for the Liberia Telecommunications Corporation (LIBTELCO) to reposition the incumbent operator in a liberalized market;
2. A Strategic Plan and Transaction Documents to implement the divestiture of the GoL from the CCL;
3. A Feasibility Study on the technical, regulatory, policy, environmental, financial and economic feasibility of deploying a terrestrial fiber telecommunications backbone for national and regional connectivity;
4. Regulations and Operating Guidelines establishing a Universal Access regime and Fund to increase access of the population to telecommunications services and extend the reach of services to un-served and under-served areas of the country;
5. An e-Government Projects Management Office at the Ministry of Posts and Telecommunications (MoPT);
6. Capacity building support for the MoPT and LTA.

3.4.3 Component 3: Implementation Support

This component includes activities for fiduciary and environmental safeguards compliance, M&E, procurement and financial management. Outputs include the following:

1. A Project Implementation Manual
2. An Environmental Impact Assessment on the landing of the ACE cable and construction of the ACE landing station
3. An Environmental Management Plan to mitigate any impacts of ACE landing
4. Technical coaching and an Operations and Maintenance Manual for staff of the ACE/CCL landing station
5. An M&E Plan and Manual and periodic M&E reports updating the Results Framework
6. Annual Work Plans & Budgets
7. Updated procurement plans
8. Interim Financial Reports
9. Annual Financial Audits by external auditors

4.0 COMPLIANCE WITH SAFEGUARD, FIDUCIARY AND LEGAL COVENANTS

The Project has satisfactorily complied with all fiduciary, safeguard and legal covenants as specified in the Financing Agreement. The status of compliance is provided in Table 3.

Condition	Compliance Status
Execute a Subsidiary Grant Agreement between the GoL and the LTA	The GoL and LTA executed the Agreement on May 16, 2011
Execute a Contractual Agreement between the GoL and the CCL	The GoL and CCL executed the Contractual Agreement on May 5, 2011
Establish and maintain the Project Implementation Unit (PIU)	PIU established in May 2011
Adopt a Project Implementation Manual (PIM)	PIM adopted in June 2011
Ratify the Financing Agreement (FA)	FA ratified by Liberia National Legislature and signed into law by President of Liberia on May 30, 2011
Maintain an adequately staffed Project Financial Management Unit (PFMU)	The PFMU has satisfactorily provided financial management services throughout the life of the Project
Implement the provisions of the Environmental and Social Management Plan (ESMP) pursuant to the Environmental and Social Management Framework (ESMF) as regards the off-shore and on-shore laying of the ACE cable and construction of the ACE landing station.	ESMF and ESMP established in accordance with World Bank and Liberia Environmental Protection Agency standards and policies. No adverse environmental, social or resettlement issues were reported during Project implementation.
Recruit an external auditor for periodic audit of Project financial statements	The Project Financial Statements have been audited by an independent firm of Certified Public Accountants for each fiscal period of Project life. No adverse findings have been indicated in any of the audit reports.
Issue Regulations and Operating Manual for implementation of a Universal Access Fund (UAF) in form and substance satisfactory to the IDA	The Bank on February 2, 2016, indicated that the withdrawal condition under Section IV.B.1. (b) of Schedule 2 to the Financing Agreement had been satisfied with the issuance by the LTA of UAF Regulations and Operating Manual.
Monitor & Evaluate on an on-going basis the implementation of the Project and progress towards achievement of objectives	Project M&E has been on-going with issuance of periodic reports in accordance with the Project's M&E Plan and M&E Manual.
Prepare Annual Work Plans & Budgets (AWP&B)	AWP&B's have been prepared for each fiscal period of Project life

Table 3: Compliance with Fiduciary and Legal Covenants

5.0 ASSESSMENT OF RISK TO DEVELOPMENT OUTCOMES

Mitigation measures identified at appraisal have proven adequate in ensuring that fiduciary, safeguards and implementation risks have not prevented the achievement of Project objectives. Technical assistance has developed regulatory instruments (see 3.4.2 above) to support the telecommunications regulator in maintaining a competitive environment governed by open access principles, a critical ingredient for sustaining reduced prices for and increased access to telecommunications services. These regulatory instruments should effectively mitigate the risk of anti-competitive consolidation within the sector.

The risk that demand and prices will plateau in the absence of terrestrial fiber access networks has been moderated by GoL's validation of the Project's feasibility study on the roll-out of a terrestrial fiber backbone and the GoL's committed facilitation of Google's implementation of the Monrovia metropolitan area fiber network. GoL's efforts to seek financing for the phased deployment of a national backbone, guided by the Project's backbone feasibility study, is a demonstrable indication of the government's commitment to sustain the gains achieved by the Project.

Establishment of the Universal Access Governing Board and other administrative structures of the Universal Access Fund, as mandated by the Regulations developed through the Project, are a further manifestation of the impact of Project intervention on increasing the reach of broadband networks to underserved and unserved portions of the population.

The Project's support for capacity building activities for the telecommunications regulator and the policy maker and the approval by GoL of a divestiture implementation plan are further measures and actions for the sustainability of the Project's development outcomes.

One risk to achievement of higher level outcomes is the absence of Project activities targeted at creating demand for broadband. The Project provided limited support for e-government pilot projects through the e-government Projects Management Office established with Project financing and technical assistance. However, no work under the Project was directed at ICT education, development of innovation centers and local applications, government e-services and other activities to spur demand, which would further sustain the reduction in prices and increase the reach of services to achieve the full development impact of the Project's intervention.

6.0 ASSESSMENT OF ENVIRONMENTAL IMPACT

The landing of the ACE fiber optic cable and construction of cable landing station triggered the Bank's policies on Environmental Assessment (OP 4.01), Physical Cultural Resources (OP 4.11) and Natural Habitat (OP 4.04). In compliance with these policies and those of the country's Environmental Protection Agency (EPA), an environmental impact assessment (EIA) was conducted resulting in development of an Environmental and Social Management Framework (ESMF) which informed the development and implementation of an Environmental and Social Management Plan (ESMP). The Bank's involuntary resettlement policy (OP 4.12) was not triggered as no persons were displaced as a consequence of the cable landing or landing station construction.

The objective of the EIA was to:

- i. Establish the project's area of influence;
- ii. Describe the nature of the baseline environmental, socioeconomics and health status of the project's area of influence;
- iii. Identify negative and positive impacts that are likely to result from the implementation of the ACE Cable Project in Liberia;
- iv. Generate mitigation options that can be used to reduce (or completely eliminate) the negative impacts of the project during construction and operations;
- v. Develop an Environmental and Social Management Plan (ESMP) that must be in place to ensure continuous environmental soundness throughout the project lifetime.

The EIA found that environmental and social impact was generally low and that minimal mitigation measures would ensure compliance with Bank and national safeguards policies. The ESMF and ESMP were adequately consulted upon and disclosed, including through a survey of residents at the site of the cable landing and beach manhole. The survey found no adverse impact on community residents, though many survey respondents indicated insufficient knowledge and information about the landing of the cable.

A follow-up Bank safeguards assessment on compliance with the ESMP in 2012 recommended the establishment of a grievance and social unit at CCL and institution of a grievance redress mechanism, in keeping with the ESMP. In compliance with the recommendations of the Bank, the Project issued a safeguards compliance report in August 2012, including reports from contractors building the landing station and results of the survey of community residents.

7.0 IMPLEMENTATION OF MONITORING & EVALUATION

The Project complied with provisions of the Financing Agreement for monitoring of the progress towards achievement of the Project's objectives. An M&E Plan was developed in consonance with the Results Framework instituting twice yearly collection of data on PDO and Intermediate indicators. Periodic reports evaluating the collected data and updating the Results Framework were disclosed.

Data was collected from telecommunications service providers through the Liberia Telecommunications Authority using data collection forms developed through extensive consultations with data providers.

The design of the M&E Results Framework and data collection instrument were well conceived and remained consistent with International Telecommunications Union (ITU) indicators and processes.

The updated Results Framework is included at Annex 2.

8.0 ASSESSMENT OF BANK AND BORROWER PERFORMANCE

8.1 Bank Performance

The Bank provided satisfactory support for Project implementation. Service providers, in responding to PDO indicator “Impact on Telecoms Sector of World Bank Technical Assistance”, rated the Bank’s intervention at 3 out of 5, an aggregate assessing the sustainability of the Bank’s intervention, the quality of studies, and establishment of a more favorable environment for development of telecommunications.

The quality of the Bank’s appraisal and design of the Project is evidenced by the achievement of PDO outcomes with minimal restructuring and without additional financing. The Bank remained responsive to requests to adjust Project activities to meet changing requirements of GoL and stakeholders. The Project received adequate implementation supervision and support from the Bank.

Evidence of the Bank’s responsiveness to change requests is demonstrated in the following activities among others:

1. Approval of request from CCL for technical coaching assistance for CCL
2. Approval of request from CCL for supply of a demultiplexer to ensure open access to CCL capacity by ISPs
3. Approval of request from CCL for support of a station manager
4. Approval of request from the Ministry of Posts & Telecommunications for support for development of an e-government web portal
5. Approval of request from the Ministry of Posts & Telecommunications for development of an e-labor application

These changes, though not factored into the original Project design, were instrumental in furthering achievement of Project objectives by capacitating CCL to effectively operate and manage the landing station, and by demonstrating to decision makers, through the e-government pilot applications, the effectiveness of e-applications in bringing efficiency to government services.

8.2 Borrower Performance

The Borrower, and its Implementing Agency, provided satisfactory support for Project implementation. The Borrower and Implementing Agency fully complied with covenants of the Financing Agreement, the Contractual Agreement between GoL and CCL, and the Subsidiary Grant Agreement between GoL and the LTA.

The Implementing Agency remained actively engaged at the highest level with Project activities and provided effective oversight of procurement and other fiduciary issues and granted timely approvals where required. The achievement of Project objectives can to a large extent be attributed to the effective coordination between the Borrower, the Implementing Agency and the Project Implementation Unit (PIU).

9.0 ASSESSMENT OF PROCUREMENT MANAGEMENT

The Bank last conducted a Procurement Post Review (PPR) of the Project in February 2016 and found that procurement processes and contract administration were of generally good quality, reliability, timeliness, and transparency with minor corrective actions needed by the Bank. The Project received an overall procurement risk rating of **Moderate**, an improvement over the High risk rating at appraisal.

The PPR assessed a **Low** rating for the following procurement risk categories:

Awards: Assessment of quality of, and adherence to, contract award requirements, including amendments, variation orders, and extensions

Publications: Assessment of quality of, and adherence to, advertising and contract award publication requirements for applicable contracts

Bidding: Assessment of quality of, and adherence to, requirements for bidding documents, including RFP's, LOI's, short lists, terms of reference, and other applicable documents

Evaluation: Assessment of quality of, and adherence to, bid evaluation requirements/criteria, including draft contracts, technical and financial evaluation reports, and bid amendments, if applicable

A **Low** rating was also attached to the following contract administration performance categories:

Implementation: Assessment of quality of, and adherence to, contract implementation criteria, including results of physical inspections

Record-keeping: Availability, quality, security and completeness of contract records and files

Compliance: Assessment of adherence to all contractual compliance with agreed provisions; adherence to all related anti-corruption practices

The PPR flagged two risks categories – Procurement planning and payment delays – for additional attention and gave these categories a **Moderate** risk rating. The PPR urged the Project to improve procurement plan updating and structure and to avoid delays in contract payments.

10.0 ASSESSMENT OF FINANCIAL MANAGEMENT

The Projects Financial Management Unit (PFMU) at the Ministry of Finance provided Project financial management services throughout implementation. The PFMU has been responsible for the maintenance of accounting records, preparation of financial statements, preparation of the quarterly Interim Financial Reports, and the processing of withdrawal applications and payments.

The PFMU has provided satisfactory services for the Project. The Unit has been professional in its approach and activities and remained compliant with its Financial Procedures Manual. Processing of payments and withdrawal applications and preparation of financial reports has

been timely, with no instances of ineligible expenditures. At Project Closure, the disbursement rate was at 99.89%.

Throughout Project implementation, financial management has received **ISR FM ratings of Satisfactory with Moderate FM risk ratings**. Financial management arrangements have consistently been found to be adequate for ensuring that funds are used efficiently and economically for intended purposes. Budgeting, accounting, internal controls, funds flow, financial reporting, external auditing, and transaction reviews were all consistently found to be without exception.

External audit reports, including that conducted for the period ending June 30, 2015, have consistently found the Project's financial management procedures and guidelines to have been adhered to with no exceptions found in the statements of expenditure or accounts. The auditors consistently found receipts to have been properly accounted for and withdrawals and expenditures eligible.

11.0 ORGANIZATION AND MANAGEMENT

Institutional arrangements have proven satisfactory throughout implementation. The Project Implementation Unit (PIU) remained adequately staffed with a Project Coordinator, Procurement Specialist, M&E Specialist, and support staff. Financial management was outsourced to the PFMU at the Ministry of Finance. Focal persons at the MoPT, the LTA and Libtelco supported the M&E function and provided coordination support for activities directly benefiting those institutions. Apart from the procurement specialist there was no turn-over of staff throughout implementation.

The PIU, in compliance with the Financing Agreement, prepared Annual Work Plans & Budgets (AWP&B) and annual project reports, including M&E reports, for each fiscal period throughout implementation.

The PIU coordinated technical assistance, under the enabling environment component, to support the LTA in its regulatory function and staff capacity building, and for the MoPT in its policy formulation, e-government functionality and capacity building for staff. Table 4 identifies principal stakeholders and key technical assistance provided.

Institution	Technical Assistance
Ministry of Posts & Telecommunications	Support provided for policy formulation, staff capacity building and study tours, and establishment of e-government projects management office
Liberia Telecommunications Corporation (Libtelco)	Technical assistance for repositioning in market through 5-year strategic plan; short-term technical assistance for sales, marketing, and finance functions
Liberia Telecommunications Authority (LTA)	Technical support for formulation and revision of regulations and guidelines, establishment of Universal Access Fund, revision of interconnection tariff model; capacity building
Ministry of Finance	Technical advisory support for divestiture of GoL from CCL
Cable Consortium of Liberia (CCL)	Establishment of PPP structure; support for station manager, legal advisor, and technical coach; purchase & installation of a demultiplexer; development of a business plan

ANNEX 1

OUTPUTS BY COMPONENT

Activities	Outputs	Intermediate Outcomes
Co-funding Liberia's membership in ACE	ACE fiber optic cable landed in Liberia; Landing station constructed & equipped; Available broadband capacity of 400 STM-1s	Increased volume and lower cost of broadband capacity
PPP Design of SPV for ownership and management of landing station	CCL shareholders' agreement; CCL Articles of Incorporation; Set up of CCL Board and management team	ACE Broadband capacity managed under Open Access principles
Legal & Regulatory support for improved connectivity	CCL License; Revised Interconnection Regulation; Revised Licensing Regulation; License Fee Regulation; Price Cap Decision on CCL; CCL Business Plan	A predictable and transparent regulatory environment conducive to private sector participation and competition with open access to broadband capacity
Advisory and implementation support for divestiture of GoL from CCL	CCL Business Case and share Valuation; Divestiture strategy & implementation plan; Information Memorandum	Upon divestiture, GoL shares in CCL sold to private investor with funds available for sector development (backbone, metropolitan fiber ring, universal access, etc.) ⁱ
Formulation of a regime for Universal Access (UA) and establishment of a Universal Access Fund	UA demand study; UA Regulations; UA Operations Manual; Set-up of UA Governing Board, Implementation Committee and Implementation Unit; UA account open at local bank	Increased reach of broadband networks upon implementation of UA projects to extend reach to underserved and unserved population centers ⁱⁱ
Conduct of a Feasibility Study for the deployment of a national telecommunications Backbone	Report on Legal, Regulatory & Policy Framework for the Backbone; Report on Developmental & Environmental Impact of the Backbone; Report on the Technical Design, Implementation Strategy,	Increased reach and reduced cost of broadband upon roll-out of national backbone ⁱⁱⁱ

	Business & Financing Model for the Backbone	
Activities	Outputs	Intermediate Outcomes
Advisory support for the Repositioning of Libtelco	5-year strategic Repositioning Plan; Implementation Plan	Strengthened national operator better positioned in liberalized telecoms sector
Business Advisory Support for Libtelco	Hands on technical support, mentorship and analysis of recommended technology, network infrastructure, equipment and protocols; Hands on financial planning, reporting, mentorship and analysis; Hands on mentorship, planning and supervision of the sales and marketing functions	Strengthened national operator better positioned in liberalized telecoms sector
Legal Advisory Support for CCL	Legal and administrative instruments, policies and procedures for CCL	Improved administrative and legal controls for CCL
Assessment of Competition in Liberia Telecommunications Market	Retail Market Definition and SMP Assessment; Wholesale Market Definition and SMP Assessment; Regulations on Competition proceedings; Competition Assessment Guidelines; Guidelines for Imputation Testing	Improved environment for competition; strengthened capacity of LTA to regulate the sector

Establishment of e-Government Projects Management Office (PMO) at MoPT	Physical space refurbished and equipped at MoPT; Operations Manual on institutional structure and operational mechanisms for PMO; Mentorship and training of PMO staff;	Strengthened capacity of MoPT to develop and implement e-government programs and projects
Project level management and support of e-government applications and projects at PMO	Development and launch of e-Liberia web portal; Development and launch of e-labor pilot application for Ministry of Labor	Strengthened capacity of MoPT to develop and implement e-government programs and projects
Capacity Building for LTA	34 staff of all LTA departments trained in various telecoms functions	Strengthened capacity of LTA to regulate the sector
Capacity Building for MoPT	55 senior and technical staff of MoPT and other government	Strengthened capacity of MoPT and other agencies to

	agencies trained in e-government policy and implementation	develop and implement e-government programs and projects
Development of Project Implementation Manual (PIM)	PIM	Improved capacity of Project Implementation Unit; compliance with legal covenants
Conduct of Environmental Impact Assessment of ACE cable landing	Environmental & Social Management Framework (ESMF); Environmental & Social Management Plan (ESMP)	Compliance with legal covenants; environmental safeguards in place
Monitoring & Evaluation	M&E Plan; M&E Reports	Strengthened project implementation

Communications	Communications Strategy & Plan	Strengthened project implementation
Procurement Management	Procurement Plans; procurement process	Strengthened project implementation and fiduciary compliance
Financial Management	Designated account; Interim Financial Reports; Statements of Expenditure	Strengthened project implementation and fiduciary compliance
Project Coordination	Annual Work Plans & Budgets; Project Reports;	Strengthened project implementation and fiduciary compliance
External Audit	Annual Audit Reports of Project Financial Statements	Strengthened project implementation and fiduciary compliance
Supply and installation of Demultiplexer at CCL	Installed and tested demultiplexer at landing station; technical training	Access to ACE capacity by small ISPs
Support for CCL Station Manager	Technical and administrative management of landing station	Improved technical and administrative supervision of landing station
Support for CCL Technical Coach	CCL technical staff receive hands on coaching on landing station equipment & maintenance; Land cable preventive maintenance; Station test equipment; Maintenance of ALU equipment; Operations & Maintenance Manual	Improved technical capacity of ACE landing station staff
Interconnection Tariff Model Revision	Updated Interconnection Cost Model; User manual; training	Improved capacity of LTA to regulate sector

ANNEX 2

UPDATED RESULTS FRAMEWORK

A. PDO Indicators

Indicator	Baseline Value	Original Target Value	Achieved Value at Completion
Indicator 1:	Volume of international traffic (Kb/s/person)		
Value:	1Kb/s	40Kb/s	35 Kb/s
Date:	2010		Sept. 2016
Indicator 2:	Access to Internet Services (number of subscribers per 100 persons)		
Value:	1.5%	3%	30.78%
Date:	2010		Sept. 2016
Indicator 3:	Access to Telephone Services (number of subscribers per 100 persons)		
Value:	24%	47%	84.57%
Date:	2010		Sept. 2016
Indicator 4:	Average Monthly Price of Wholesale International Capacity (2Mb/s/month)		
Value:	\$8,000	<\$2,000	\$750
Date:	2010		Sept. 2016
Indicator 5:	Direct Project Beneficiaries/% of which women		
Value:	700,000/45%	1,400,000/50%	2,950,000/38.75%
Date:	2010		Sept. 2016
B. Intermediate Result Indicators (Component 1)			
Indicator 1:	Volume of Available International Bandwidth (Gb/s)		
Value:	0.065Gb/s	1.12	62.2Gb/s
Date:	2010		Sept. 2016
Indicator 2:	Retail Price of Internet Services (Mb/s/month)		
Value:	\$1,200	<\$500	\$400
Date:	2010		Sept. 2016
C. Intermediate Result Indicator (Component 2)			
Indicator 1:	Impact on Telecom Sector of World Bank Technical Assistance		
Value:	0	4	3
Date:	2010		Sept. 2016

ANNEX 3

CAPACITY BUILDING PROGRAMS

1. Liberia Telecommunications Authority

No.	Beneficiary	Course	Provider	Dates	Venue
1	WIEFUEH SAYEH General Counsel	Utility Regulation & Strategy	PURC	Jan 10 -22, 2011	Miami, USA
2	MOYEES KAMARA Compliance Officer	Regulating Quality of Service	IP3	Jul 8 -19, 2013	Washington DC, USA
3	SALEHO KANNEH Consumer Desk Supervisor	Telecom Consumer Code of Practice	USGTC	Sept. 9 - 20, 2013	Houston, USA
4	LUCIA QUETOH Spectrum Engineer	Radio Spectrum Monitoring Techniques	USTTI	Sept. 29 – Oct 12, 2013	Washington DC, USA
5	CHRIS WILLIAMS Information Officer	Effective communications	CMD	Oct 7 -11, 2013	Uyo, Nigeria
6	LEAMOH WISON Spectrum Engineer	Spectrum Master Class	Interconnect	Nov 18 -23, 2013	Bath, UK
7	ELIJAH GLAY Universal Access Officer	Global Current Issues and Strategies in Universal Service Provision Fund Management	USGTC	May 5 – 16, 2014	Houston, USA
8	KWATAMA BETTY Economic Analyst	Economic Regulation Master Class	Interconnect	July 14 – 18, 2014	Bath, UK
9	EMMANUEL PAYEGAR Director of Engineering	Master Class in Numbering, Portability, Naming and Addressing	Interconnect	Sept 29 - Oct 3, 2015	Bath, UK
10	25 participants comprising Commissioners, Directors & Senior staff of the departments of AO&L, E&T, IGMS and L&R	<u>In-Country Training</u> Performing Regulatory Impact Analysis	CTO	Oct 5 - 9, 2015	Monrovia, Liberia
11	25 participants comprising Commissioners, Directors & Senior staff of the departments	<u>In-Country Training</u> Next Generation Markets & Technologies	CTO	Sept 28 - Oct 2, 2015	Monrovia, Liberia

of AO&L, E&T, IGMS and L&R				
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2. Ministry of Posts & Telecommunications

No.	Beneficiary	Course	Provider	Dates	Venue
1	Joe Bandoo Assistant Minister	Utility Regulation	PURC	Jan. 10 - 21, 2011	USA
2	Sekou Kromah, Dep. Minister James Sulonteh, Technical Analyst Morvella Johnson, Policy Officer	E-Gov Study Tour	Rwanda Ministry of ICT	July 16 – 20, 2012	Rwanda
3	Frederick Norkeh, Minister Zotawon Titus, Deputy Minister Fohn Dolomengi, Deputy Minister Nicholas Johnson, Asst. Minister	E-Gov Policy Study Tour	Ghana Ministry of Communications	Feb. 5 – 14, 2014	Ghana
3	25 senior, mid-level, and technical staff from the MOPT, LTA and Libtelco	In-Country Workshop: ICT Applications & Development; E-Gov Portals	Center for IT Professional Development, GIMPA	August 2015	Liberia
4	5 Technical Staff from PMO, MOPT	E-Gov Technical Study Tour	Ghana National IT Agency (NITA)	Nov. 8 – 13, 2015	Ghana
5	15 IT staff from Ministries, CIO, PMO	E-Gov Portal Development	Sahara Technology	Jun. 6 – 10, 2016	Liberia
6	15 policy makers from government agencies	E-Gov Training for Policy Makers	Sahara Technology	Jun. 13-17, 2016	Liberia
7	15 IT staff from government ministries	E-Gov training for IT professionals	Sahara Technology	Jun 22 – 23, 2016	Liberia
8	15 IT staff from government ministries	E-Gov project management	Sahara Technology	Jun 20 – 24, 2016	Liberia

3. Cable Consortium of Liberia

No.	Beneficiary	Training	Provider	Venue
1	Francis SORSOR	ACE "Type A" Training	ACE	Paris
2	Linus GEDEO	ACE "Type A" Training	ACE	Paris
3	Sarway M. GENESIS	ACE "Type A" Training	ACE	Paris
4	Sateyea QUAYE	ACE "Type A" Training	ACE	Paris
5	Jallah KAMARA	ACE "Type A" Training	ACE	Paris
6	Karvee WEEDOR	ACE "Type A" Training	ACE	Paris
7	Dovert ANDREWS	ACE "Type A" Training	ACE	Paris
8	Daniel Brewer	ACE "Type A" Training	ACE	Paris
1	Francis SORSOR	ACE "Type B1 & B2" Training	ACE	Monrovia
2	Linus GEDEO	ACE "Type B1 & B2" Training	ACE	Monrovia
3	Sateyea QUAYE	ACE "Type B1 & B2" Training	ACE	Monrovia
4	Jallah KAMARA	ACE "Type B1 & B2" Training	ACE	Monrovia
5	Karvee WEEDOR	ACE "Type B1 & B2" Training	ACE	Monrovia
6	Dovert ANDREWS	ACE "Type B1 & B2" Training	ACE	Monrovia
7	Daniel BREWER	ACE "Type B1 & B2" Training	ACE	Monrovia
1	Jed G. BADAWI	O&M Coaching	Roger Ibrahim	Monrovia
2	Lawrence NYUMAH	O&M Coaching	Roger Ibrahim	Monrovia
3	Winifed WILLIAMS	O&M Coaching	Roger Ibrahim	Monrovia
4	Alexander BAYOH	O&M Coaching	Roger Ibrahim	Monrovia
5	Daniel BREWER	O&M Coaching	Roger Ibrahim	Monrovia
1	Jed G. BADAWI	Demux Training	Huawei	Monrovia
2	Lawrence NYUMAH	Demux Training	Huawei	Monrovia
3	Winifed WILLIAMS	Demux Training	Huawei	Monrovia
4	Alexander M. BAYOH	Demux Training	Huawei	Monrovia
5	Daniel BREWER	Demux Training	Huawei	Monrovia
6	Rajan DUBEY	Demux Training	Huawei	Monrovia
7	Prince KALIKU	Demux Training	Huawei	Monrovia
8	John GIZEA	Demux Training	Huawei	Monrovia

ⁱ Divestiture process initiated but not completed at Project Closure

ⁱⁱ UA projects to be implemented under national UA program from funds assessed from licensed service providers as per the Telecommunications Law and in compliance with UA Regulations and Operations Manual.

ⁱⁱⁱ Government of Liberia, at Project Closure, is in process of sourcing financing for the phased roll-out of a national fiber backbone.

Annex 9. Assessment of Key Risks Identified during Project Appraisal for Liberia

Description of Risk	Mitigation Measure Proposed at PAD	Risk Status at Closure
Design of the proposed project is highly complex and risky (PPP for ownership and management of landing station)	The project benefited from upfront TA and legal support under the PPA	The PPP structure proved to be effective, with CCL in operation soon after project approval
Pre-feasibility studies indicated need for significant investment and contributions from both private and public sources; risk that private sector contributions may not materialize	PPP structure to provide comfort for all actors	Two private companies contributed \$2.5 million each, prior to project approval. An additional company bought into CCL following its establishment.
Very limited capacity of policy makers and young regulatory institution without prior experience with open access regimes	Targeted TA and regulatory support under the project to support LTA (regulator) and MoPT	The project included training and capacity building for LTA and MoPT. A disbursement condition for establishment of regulations for the operation of the Universal Access Fund was met.
GoL could be tempted to keep GoL ownership of landing station to maximize GoL revenues	The sector is very open in Liberia and is private sector driven. Policy and legal environment are conducive to private participation. Additionally, elements in PPA included to ensure divestiture of shares. Finally, Landing station designed as a pass through structure, with no profits to be generated, mitigating interest from GoL for holding shares in long term.	As of project closure the government had not yet divested any of its shares in CCL. However, this is not due to a desire to maintain ownership shares, but instead to maximize the potential return on its investment. Completion of upcoming terrestrial backbone projects are expected to increase the value of the government's shares in CCL. In addition, the structure of CCL as a pass-through has prevented any profit generation, and eliminated the incentive for the GoL to maintain shares for that purpose.
Private operators could not be as forthcoming as anticipated and GoL may end up holding more equity in CCL than planned	PPA support for divestment including running the process, due diligence, road show and negotiating with potential buyers	Divestment studies were completed as per the project plan. While divestment has not yet occurred, private operators have expressed interest in expanding their ownership stake. During project implementation a third private operator purchased stake in CCL.
LTC could put pressure on GoL to have government shares transferred to LTC to increase LTC value head of privatization. Private sector players could decide to stay away from joint	PPP framework would provide value for LTC participating in the PPP framework and would provide guarantees to operators to invest. In addition, the legal framework does not give advantages to LTC. Finally, there is ongoing pre-privatization support to	While support was provided to LTC on privatization during the project, the future of LTC remains unclear at the time of closure. This risk remains until government divestiture

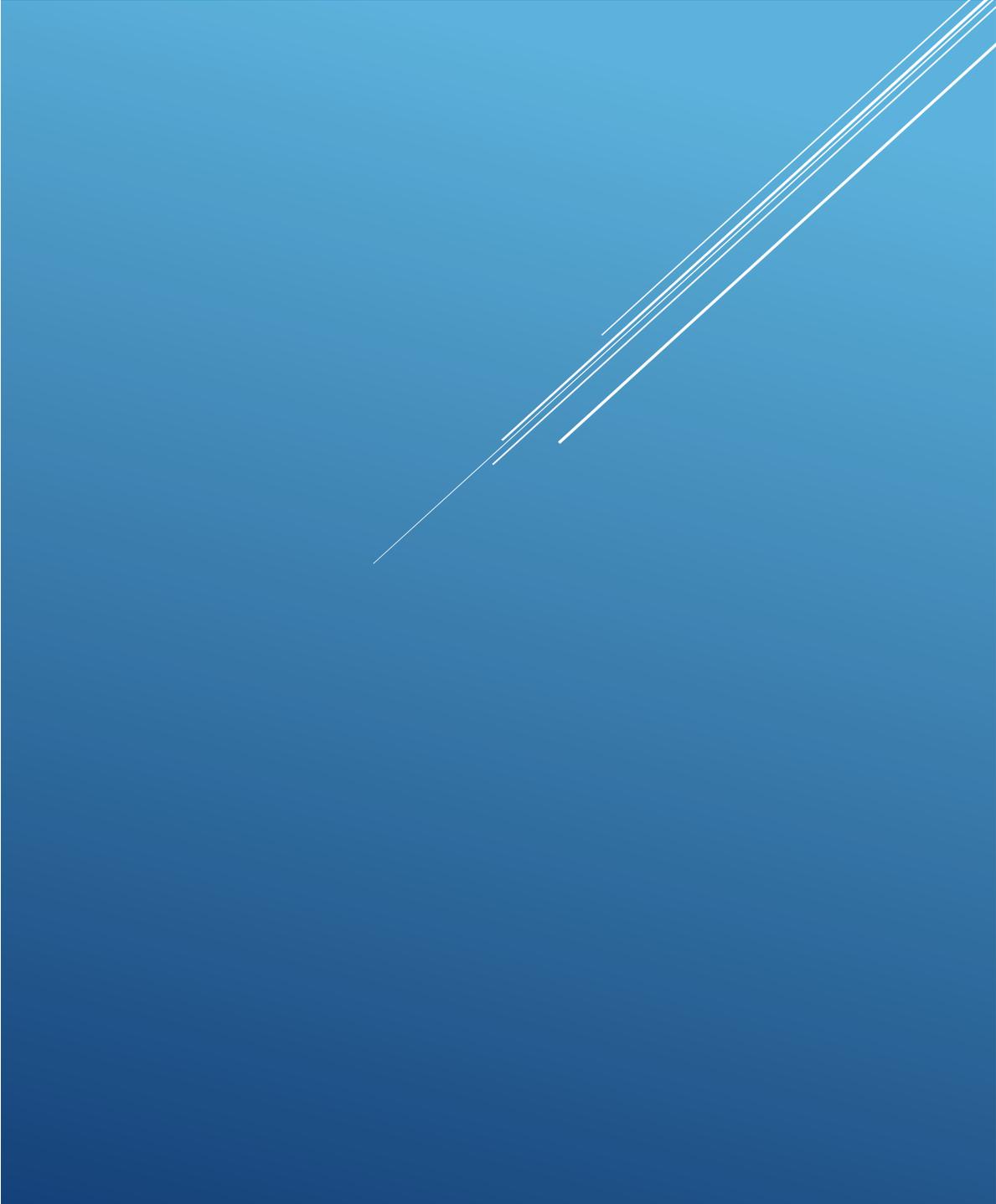
Description of Risk	Mitigation Measure Proposed at PAD	Risk Status at Closure
investment with LTC given tensions in the sector.	LTC and ongoing strategic advice on how to create value in LTC. Two major Liberian operators have committed a total of US\$5 million to invest in the SPV alongside LTC, so they will share similar goals and risks in the SPV with LTC, encouraging collaboration as connectivity is rolled out.	takes place.
Proceeds to be used for other purposes and will not support the connectivity agenda.	Improving connectivity is a high priority in GoL agenda. A mechanism will be in place to ensure that proceeds are contributed directly to Universal Access Fund. Targeted TA designed to support the enabling environment for this component. IDA contribution to universal access fund will be contingent upon successful sale of the GoL shares.	As divestiture has not yet taken place, this risk remains.
Disbursements under the Financing agreement with Liberia could start even if the Financing Agreement for Sierra Leone has not be declared effective and there is not disbursement of funds. In addition, disbursements under the Financing Agreement with Liberia could not be suspended even if disbursements under the Financing Agreement with Sierra Leone have been suspended.	If the Financing Agreement for Sierra Leone never enters into effect or if disbursements thereunder are suspended this would only reduce the scope but not the effect the overall implementation of the national activities, that can be carried out despite lack of progress of the Sierra Leone Project.	The Sierra Leona portion of the project was suspended for a period; however, this has not impacted the Liberia project.

Annex 10. Assessment of Key Risks Identified during Project Appraisal for Sierra Leone

Description of Risk	Mitigation Measure Proposed at PAD	Risk Status at Closure
Design of the proposed project is highly complex and risky (PPP for ownership and management of landing station)	The project benefited from upfront TA and legal support under the PPA	The PPP structure was prepared in consultation with GoSL however during project implementation the GoSL unilaterally redesigned the PPP as “for profit” model that sell capacity to private sector operators including the shareholders.
Pre-feasibility studies indicated need for significant investment and contributions from both private and public sources; risk that private sector contributions may not materialize	PPP structure to provide comfort for all actors	Private sector operators made initial payments when PPP agreement was signed. The remaining payments were staggered however the PPP arrangements unraveled shortly after the agreement with signed and no additional payments were made. According to SALCAB not all private sector operators honoured their financial commitments.
Very limited capacity of policy makers and young regulatory institution without prior experience with open access regimes	Targeted TA and regulatory support under the project to support NATCOM and MoIC	The project included training and capacity building for NATCOM and MoIC. Additional support is needed especially for NATCOM.
GoSL could be tempted to keep GoSL ownership of landing station to maximize Government revenue	The GoSL made public commitment to liberalise the international gateway. Full disbursement of World Bank funding was contingent upon satisfactory progress in the divestiture process. In addition, targeted support was included under the PPA to ensure that all elements of the divestiture of shares are in place and implemented. Landing station would be managed by shareholders as a cost centre with no profits to mitigate the interest of GoSL in holding shares in long term. Full Disbursements for cable construction were contingent upon IDA satisfaction of divestiture process.	All mitigation measures were met but the risk still remains. The GoSL took full control of SALCAB from January 2014 and sells wholesale capacity to the private sector operators. The PPP has been converted to a “for profit” model and all other government owned wholesale infrastructure has been added to it. The GoSL intends to list it on the stock exchange and raise an IPO.
Private operators could not be as forthcoming as anticipated and GoSL may end up holding more equity SALCAB than planned	PPA support for divestment including running the process, due diligence, road show and negotiating with potential buyers	Private operators willingly joined the PPP. Six of the initial nine have relinquished their shares in SALBAB in view of the above.
Proceeds from divestment would be used for other purposes and will not support the connectivity agenda	Government has committed to reinvesting proceeds in the sector. The engagement of private sector will also ensure appropriate use of resources. Separately, improving connectivity is a high priority in GoSL agenda.	SALCAB has not been divested.

Description of Risk	Mitigation Measure Proposed at PAD	Risk Status at Closure
SierraTel could put pressure on GoSL to have GoSL shares transferred to SierraTel to increase company value ahead of privatization. Private sector players could decide to stay away from joint investment with Sierra Tel given tensions in the sector	Project funds supporting options for improving operational efficiency of SierraTel in response to government request. Private sector already expressed interest in SALCAB in light of regulatory and sector reforms being supported under the PPA	The Sierratel activity was cancelled as the Government entered into a management contract for Sierratel shortly after project effectiveness. Sierratel is a shareholder in SALCAB and GoSL have not transferred their shares to them.
Disbursements under the Financing agreement with Sierra Leone could start even if the Financing Agreement for Liberia has not been declared effective and there is no disbursement of funds. In addition, disbursements under the Financing Agreement with Sierra Leone could not be suspended even if disbursements under the Financing Agreement with Liberia have been suspended.	Project structured so that if the Financing Agreement for Liberia never enters into effect or if disbursements thereunder are suspended, this would only reduce the scope but not affect the overall implementation of the national activities, that can be carried out despite lack of progress of the Liberia Project	The Sierra Leone portion of the project was suspended however upon suspension lifting, all activities were implemented.

Annex 11. Consumer Perception Survey for Sierra Leone



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Executive Summary

Sierra Leone, a member of ECOWAS (Economic Community of West Africa States), is situated in West Africa. In the last decade, it has made significant strides to diversify its economy with Telecoms/ICT sector identified as a key driver of the diversification. It is against this backdrop that Sierra Leone is participating in the West Africa Regional Communications Infrastructure Programme (WARCIP).

WARCIP is prepared by the Government of Sierra Leone, with support from the World Bank Group to finance Sierra Leone's connection to ACE submarine fiber-cable system in order to improve on the quality of national, regional and international connectivity while reducing service costs. The Government of Sierra Leone through support from the World Bank is implementing the WARCIP to increase the geographical reach of broadband networks and reduce the costs of communications services in the Country. This is intended to improve the International Connectivity through the development of communication infrastructure to foster national economic development and greater regional economic integration.

The target beneficiaries of the project are the entire citizenry of Sierra Leone with deliberate efforts to focus improving gender gap in access to ICT.

The Project has the following three components:

- 1. Infrastructure component to improve connectivity**
- 2. Technical Assistance component to create an enabling environment**
- 3. Project implementation support component for coordination, monitoring and evaluation**

The WARCIP-SL M&E Framework is designed to serve as a reliable guide for an adequate monitoring and evaluation of the project. The M & E framework is used to collect data and report on all indicators specified in the Performance Tracking Table.

Under the project both technical and financial supervision and monitoring are handled at two levels: (1) internally, the WARCIP PIU is in-charge of the coordination and oversight of project activities, as well as monitoring and evaluation of results and impacts. Under the overall responsibility and guidance of the Executive Chairperson, technical aspects are handled by the various technical officers, while M&E functions are carried out by the M&E Officer and

assistants. The M&E unit, rather than being treated as an independent external agent, is integrated into the project management structure and serves as a resource for supplying key information on project implementation and delivery organogram.

Externally, project monitoring and evaluation is conducted at various levels by different stakeholders: GoSL, Civil Society Organizations (CSO) and the projects' beneficiaries and the Development/Donor partner.

In terms of methodology, under the project standard tools have been developed to collect and analysis data to feed into other decision making processes. These tools include Questionnaires, checklist, workshop and focus group and the performance tracking

Background and Objectives

Background

Country Profile



Sierra Leone, a member of ECOWAS (Economic Community of West Africa States), is situated in West Africa. It covers an area of 71,620 square kilometers (about 28,000 square miles). Just like its neighboring countries (Guinea, and Liberia), the country has a tropical climate with two different extreme seasons: dry season from November to April, and rainy seasons from May to October although rain patterns in the last three years tend to deviate from this norm as it rains up to November-December. Half of the country (50%) is mountainous and about 70% of the population are engaged in the agricultural sector.

Sierra Leone became independent in 1961 but injustice, corruption and mismanagement of the country's natural resources contributed to an egregious Civil War in Sierra Leone from (1991 to

2002), which for more than a decade devastated the country. This proxy war left more than 50,000 people dead, much of the country's infrastructure destroyed, and over two million people displaced as refugees in neighboring countries.

Administratively, the country is divided into 4 provinces; 14 districts; 149 chiefdoms, 1,320 Sections and 19 Local Councils. The Provinces are Eastern, Western, Northern and Southern. The districts include: Western Urban, Western Rural districts; Bombali, Kambia, Koinadugu, Port Loko, Tonkolili, Bo, Bonthe, Moyamba, Pujehun, Kailahun, Kenema and Kono districts.

About sixteen ethnic groups inhabit Sierra Leone, each with its own language and customs. The two largest and most influential are the Temne and the Mende people. The Temne are predominantly found in the north of the country, while the Mende are predominant in the south-east. Although English is the official language spoken at schools and government, the Krio language is the most widely spoken language in Sierra Leone and unites all the different ethnic groups in the country, especially in their trade and social interaction with each other.

Sierra Leone is regarded as one of the most religiously tolerant nations in the world. Muslims and

Christians co-exist and interact with each other peacefully. Religious violence is very rare in the country and this contributes to the peace and stability of the country.

In addition, the country is a democratic state which has successfully conducted four (4) consecutive multi-party elections: 1996, 2002, 2007 and 2012 Presidential and Parliamentary elections. The country also has a local government system to support the central government and two consecutive local government elections have been successfully held: 2006 and 2012.

Sierra Leone has relied on mining, especially diamonds for over three decades and bauxite in the last eight years for its economic base. It is among the largest producers of titanium and bauxite, a major producer of gold, and has one of the world's largest deposits of rutile.

Sierra Leone is home to the third-largest natural harbor in the world. Despite exploitation of this natural wealth, 70% of its people live in poverty.

However, due to sound policies of Government and the bauxite mining boom in the last eight years, the country prior to the outbreak of the Ebola disease was one of the fastest growing economies in the world.

In 2014 the outbreak of the Ebola Virus Disease (EVD) overburdened the weak healthcare infrastructure, leading to more deaths. It created a humanitarian crisis situation and a negative spiral of weaker economic growth. The country has an extremely low life expectancy at 57.8 years and high infant mortality rate.

Going forward, the Government will need to sustain economic growth and entrench macroeconomic stability to create jobs, improve social indicators, support private sector development, develop social policies and enhance programmes designed to protect the most vulnerable segments of society. Sustaining the gains achieved requires enhanced service delivery and job creation. To achieve this in the medium and long term, the policy focus needs to be on achieving inclusive growth through the use of Information and Communications Technologies (ICTs) for an inclusive sustainable development and good governance. It is against this backdrop that Sierra Leone is participating in the West Africa Regional Communications Infrastructure Programme (WARCIP). WARCIP is prepared by the Government of Sierra Leone, with support from the World Bank Group to finance Sierra Leone's connection to ACE submarine fiber-cable system in order to improve on the quality of national, regional and international connectivity while reducing service costs. The Government of Sierra Leone through support from the World Bank is implementing the WARCIP to increase the geographical reach of broadband networks and reduce the costs of communications services in the Country. This is intended to improve the International Connectivity through the development of communication infrastructure in order to foster national economic development and greater regional economic integration.

The WARCIP-SL is financed through the International Development Association credit of US\$ 31million. The lending instrument is an Adaptable Program Loan (APL). WARCIP Sierra Leone is part of APL 1 A of the regional WARCIP program. The objectives of WARCIP Sierra Leone are fully in line with the objectives of the WARCIP program. The proposed project will be implemented over a 4-year period.

Sierra Leone is located in West Africa, bordered by the Atlantic Ocean, Guinea and Liberia, and covers a land area of 71,740 km². Its population is estimated at 6.205 million (SSL 2014) with an average annual growth rate of 2.2 percent. Sierra Leone has been relatively stable following a decade long civil conflict that ended in 2002. Notwithstanding the significant strides and efforts by the Government towards reform since the war ended in 2002, problems persist dealing with poor public service delivery and youth unemployment.

WARCIP-SL Project Objectives

The project development objective of WARCIP Sierra Leone is connectivity development with respect to increasing the geographical reach of broadband networks and to reduce cost of communication services. This should contribute to reduce the isolation of Sierra Leone's economy and support its participation in the global economy. In order to reach this objective, the project proposes an integrated approach focusing on the following key outcomes over a four (4) year period:

- I. The connection of Sierra Leone to global broadband fiber optics infrastructure
- II. The creation of a coordinated national transmission network which would ensure that Sierra Leone is able to connect effectively within national borders, and with the rest of the World including regional neighbors
- III. Creating an enabling environment and institutional strengthening to remove existing bottlenecks for private sector participation in both national and regional infrastructure development.

The expected **outcomes** of the development objective of the West Africa Regional Communication Infrastructure Program in Sierra Leone are:

- I. Increased volume of international traffic (bandwidth Kbit/s per person) to 40 from 3
- II. Increased access to telephone services to 43% from baseline of 25%
- III. Increase access to internet services to 2% from 0.28% i.e. number of subscribers per 100 people
- IV. Reduced average monthly price of wholesale international EI capacity link from Freetown (capital city) to Europe down to US\$ 2,000 from baseline figures at around US\$ 8,000/Mb
- V. Increased number of female direct project beneficiaries to 3.2 million from 2million.

Key Output of the WARCIP-SL Project

The key **outputs** of program-supported activities in Sierra Leone to achieve these outcomes include the following:

Connectivity Improved

- Sierra Leone participates in the Africa Coast to Europe (ACE) submarine cable system and achieve full membership by 2012
- Sierra Leone Cable Limited (SALCAB) incorporated to manage Government of Sierra Leone's (GoSL's) share in ACE. The company was duly incorporated on the March 26 2010 under the Sierra Leone Company Act Cap. 29 and registered as a business enterprise (No. 3762) to participate in the ACE Fiber-Optic submarine landing project as evidenced by a certificate of incorporation issued by the Office of the Registrar General, Freetown numbered 231/2010
- National and regional connectivity improved by investing in cross-border and national infrastructure for a (i) high speed government virtual private network of Ministries, Department and Agencies (MDAs) within Freetown (ii) national emergency communications network (iii) national Internet Exchange Point (IXP) (iv) terrestrial broadband backbone fiber networks and last mile broadband connections between and within key urban areas (v) additional broadband links between Sierra Leone and neighbouring countries.

Enabling Environment Created

- Public private partnership (PPP) created to own and manage the international, regional and national infrastructure that will ensure equal opportunity for operators to have unfettered access to infrastructure or services under similar terms and conditions (i.e. open access principle)
- Clear policies and regulations that addresses the policy and regulatory bottlenecks are established to maximizes the benefits from the proposed connectivity agenda including the liberalization of the international gateway
- Build capacity of MoIC, SALCAB and National Telecommunication Commission (NATCOM) built for policy guidance, ACE management and regulatory functions.

Implementation Support Provided

Project Implementation Unit (PIU) established within MoIC with support needed to strengthen GoSL to implement the connectivity project including hiring dedicated staff, office equipment, operating cost, audits, monitoring and evaluation (M&E) and conducting required studies.

The application of ICT is so pervasive that this project targets the entire citizenry of Sierra Leone which make up the project beneficiaries with deliberate efforts factored in the project to address the gender gap in access to ICT. Therefore M&E methods in Section 6 will include surveys such as Citizens Report Cards to gauge the citizen's evaluation of ICT services provided.

The project will provide direct economic benefits (from increased telecommunications access and reliability) and indirect social benefits contributing to societal wellbeing. These benefits as described according to project components include:

Components of Project

Component 1. Infrastructure component to improve connectivity

- Full connectivity solution will promote cheaper access to communications and more effective global communication
- Intensification of broadband networks will stimulate investment and economic growth
- ICT can help promote peace and social cohesion whilst rebuilding the economy
- WARCIP Sierra Leone will increase access to ICT services, lower costs and improve service quality
- increased and cheaper bandwidth will provide opportunity for Sierra Leone to develop e-government applications for improving governance and accountability
- improved ICT will reduce transaction costs for businesses and increase productivity and profitability.
- The country's fixed-line network would experience significant growth to extend reliable linkages to other urban centers apart from Freetown
- private sector will take advantage of ICT to communicate, share information, improve productivity/service delivery and improve access to markets.
- development of a regional sense of community through greater equality of information sharing across geographical regions and across groups in society

- increased employment creation due to lower entry costs thereby facilitating the start-up of new businesses.
- improved educational opportunities through increase in access to information and education resources for research
- increased capacity and lower cost will allow for faster and more reliable transmission for data and voice for existing business.
- improvement of business performance as well as create opportunities for expansion.
- improved connectivity between African especially ECOWAS countries.
- increased cooperation between the countries on the system.

Component 2. Technical Assistance component to create an enabling environment

- MoIC's policy guidance capability enhanced as the implementing Ministry including improvement in intra-government communications
- NATCOM's capacity built to effectively perform its regulatory functions and undertake measures to improve standards in the ICT sector
- SALCAB should benefit from improved capacity building for managing ACE and ensuring effective partnership with the private sector
- liberalization of international gateway for competitiveness and the attendant improvement in product quality and reduction in cost
- high growth of mobile telecommunications sector resulting from sector liberalization
- institutional policy and regulatory capacity strengthened to sustain existing reforms and initiate additional reforms
- human and physical capital platform made robust enough to run Information Technology Enabled Services (ITES)
- open and non-discriminatory access to cable landing facility within PPP framework
- SIERRATEL Commercialized.

Component 3. Project implementation support component for coordination, monitoring and evaluation

This component will work to achieve the full range of benefits from Components 1, 2 and contribute towards the overall long-term sustainable management of connectivity development in the country/region.

Survey Method

The methodology employed was designed to measure the consumers' experience using voice and data services in Sierra Leone. It was also designed with a view to produce statistical data sets that treats each respondent on an even footing. It was envisaged that this basis would allow us to compare service providers' networks as an industry, and to be able to compare the performance of operator's network in a manner that is objective.

Direct interviews were conducted by well-trained enumerators to collect data from respondents who were approached at random, from selected areas in the country. All data collection activities conformed to standard procedures for conducting field surveys.

3.1 Target Areas

The table below shows the list of areas, from which the study participants were drawn

MUNICIPALITY	SIZE
KENEMA CITY	4007
PORT LOKO	478
MAKENI CITY	2521
BO CITY	3478
BONTHE URBAN	200
FREETOWN	14933

Table 2: List of Areas

3.2 Research Design

A random sampling method was adopted for the selection of the survey sample in all six locations visited. The first stage involved the selection of the location in each stratum. Six Location were selected Kenema City, Port Loko, Makeni City, Bo City, Bonthe Urban and Freetown. Not everyone was however interviewed in the exercise. Responses were restricted only to users of mobile phones and/or the internet that are above the age of 15 years. Thus, the unit of measurement was users of mobile phones, over the age of 15.

The approach to our methodology was as follows:

- ❖ The Survey was conducted in public places where large congregations of consumer could be located.
- ❖ Taking sufficient samples to produce statistically significant results.

- ❖ Data captured in a fair and unbiased way.
Using experienced and qualified enumerators to conduct the survey.

3.3. Training.

The survey teams were trained to explain the questionnaire in English and the various local languages to facilitate consumers understanding of the information required. BCC, KMC and BAC were all consulted before conducting the survey.

Survey results

3.4. Demographic Regions

Sierra Leone is divided into 4 provinces; 14 districts; and 19 Local Councils. Six out of the 19 local councils were selected to conduct the survey. Of the consumers surveyed, most of the internet activity is naturally concentrated in the large metropolis areas of Freetown (56.03%), Kenema City (15.12%), Bo (14.78%) and Makeni City (10.65%)

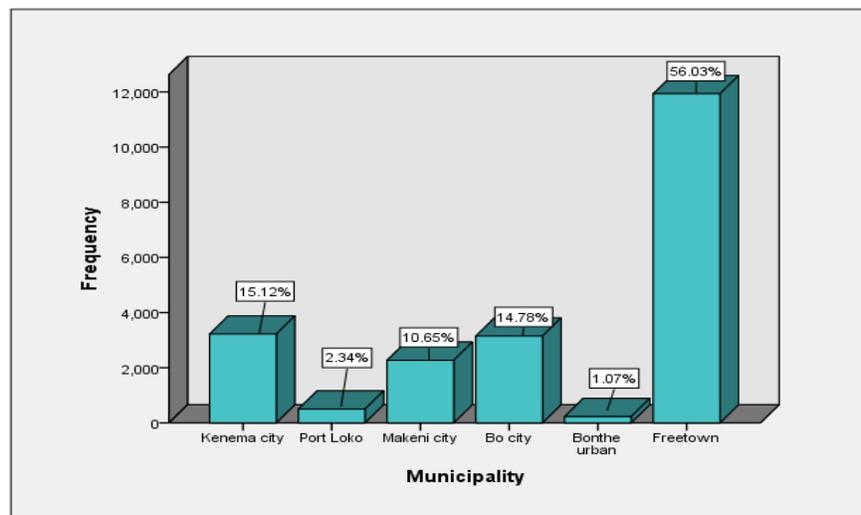


Figure 1: Municipality

Gender Statistics

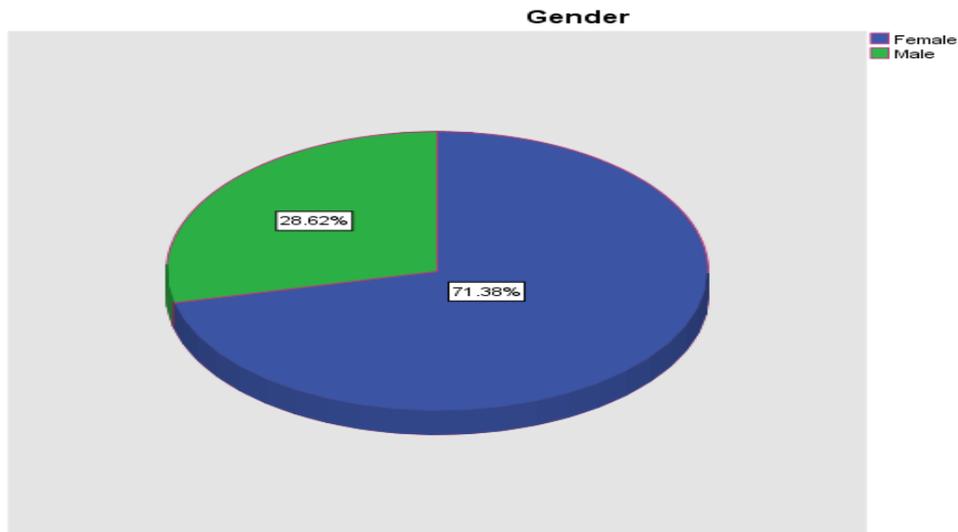


Figure 2. Gender

Figure 2 depicts the distribution of consumers by gender. From the sample size, it is evident that 71.38% of the consumer surveyed were females with a male proportion of 28.62%.

Respondent Age Groups

Figure 3 depicts the distribution of consumers by age.

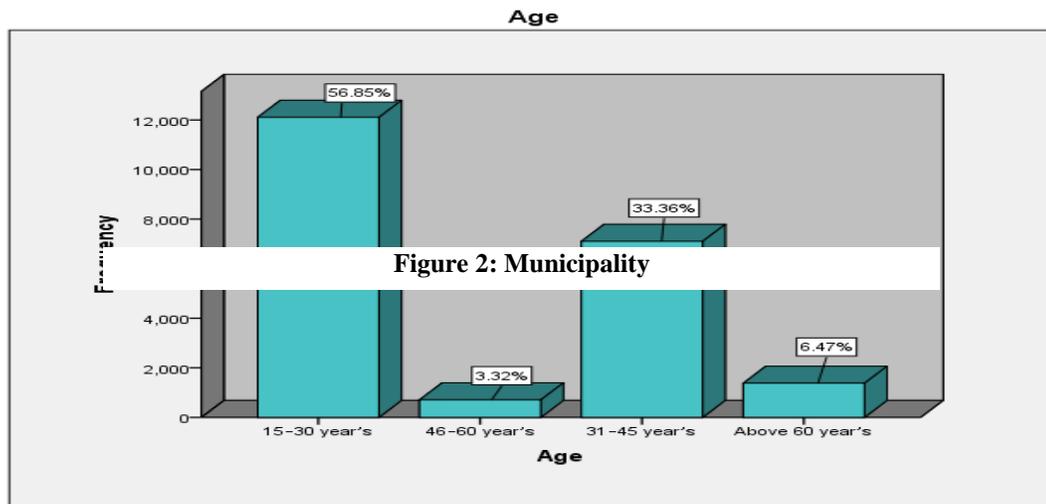


Figure 3: Age

There were more respondents in the 15 to 30 year age group (56.85%) than other groups. Internet usage among the population tends to taper down the higher the age group is after 31 to 45. This is explicable by:

1. The younger generation is more connected and uses the internet more, since their lives are more affected by the internet and a lot of interaction and communication by this age group is done online through social media and other web facilities like VOIP, Internet SMS etc.

Education

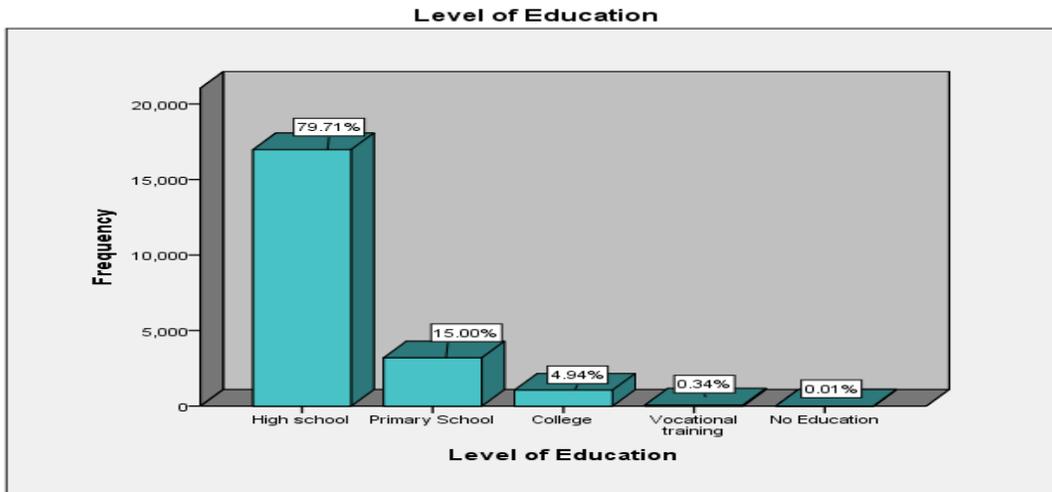


Figure 4: Level of Education

Figure 4 below illustrates the level of consumer education.

Most of the respondents about 79.71% have at least attended high School or their highest level of education is high school.

Employment Status

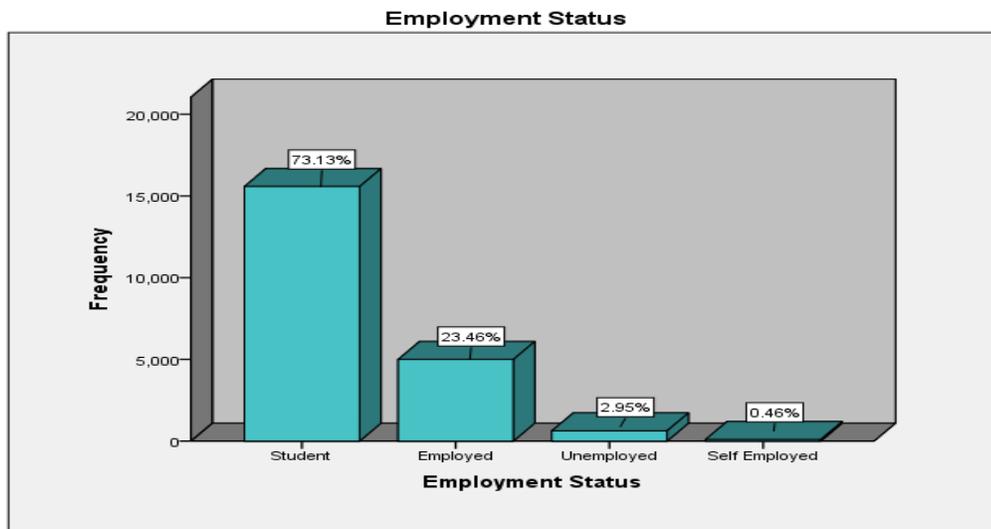


Figure 5: Employment Status

Interestingly over 73% of respondent are students. The next largest groups of respondents are Employed 23.46%, Self Employed is under 1% and Unemployed 2.95%.

Use of Internet

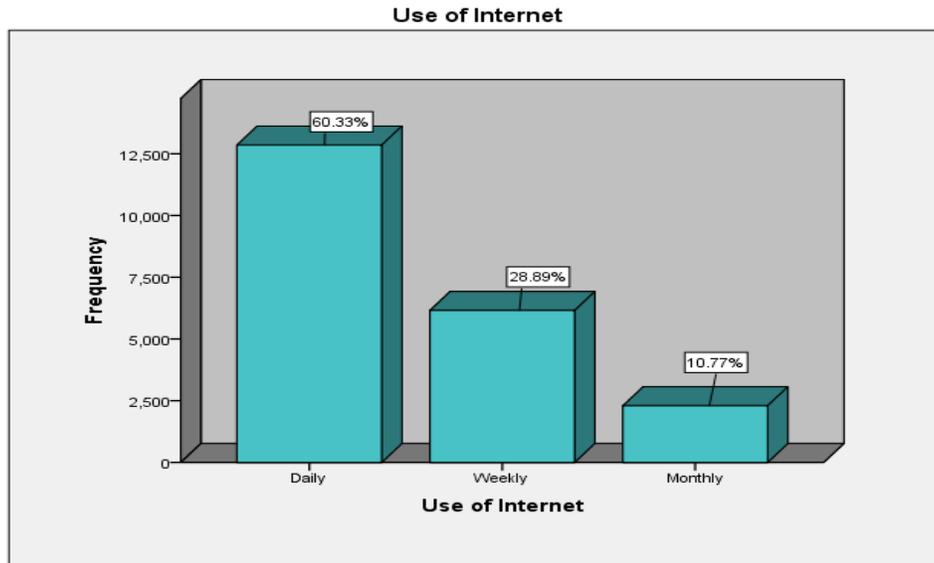


Figure 6: Use of Internet

Out of the prospective respondents approached by enumerators for the survey, over 60% indicated that they use the internet daily, about 29% of respondent use it weekly and a little over 11% use the internet monthly.

Frequency of Internet Use

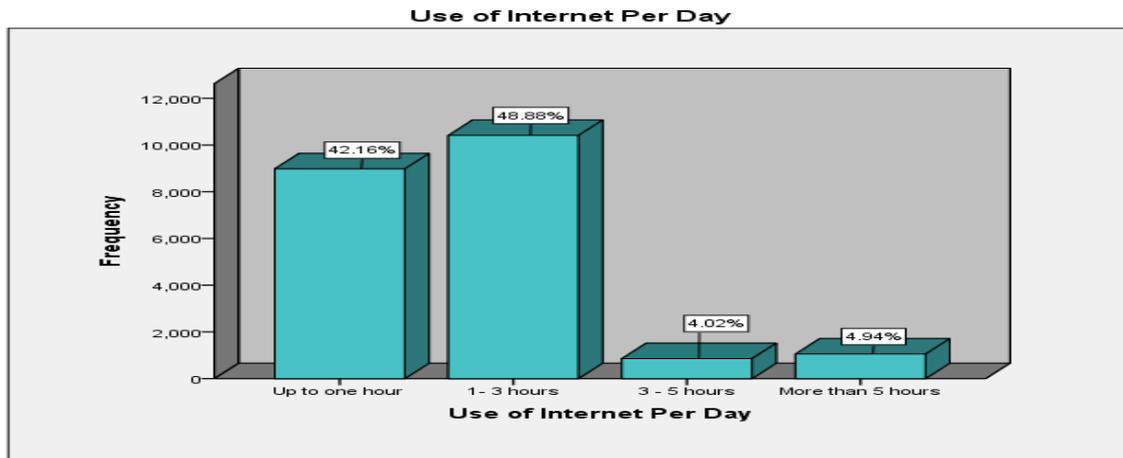


Figure 7: Use of Internet per Day

Most of the respondent use the internet between one to three hours daily. As shown in the graph above, the proportion of daily usage reduces as the number of hours increase. This could be as result of several factors such accessibility, affordability, etc.

Main Purposes of Internet Use

The largest group of respondents (70.76%) indicate that they use the internet mostly for Work/ school purpose than any other reason. Social Networking such as Facebook make up almost 29% while online calling (VoIP) using Viber, WhatsApp, Skype etc., make up less than (1%). This accurately reflects the low activity and under-developed nature of these categories in the country.

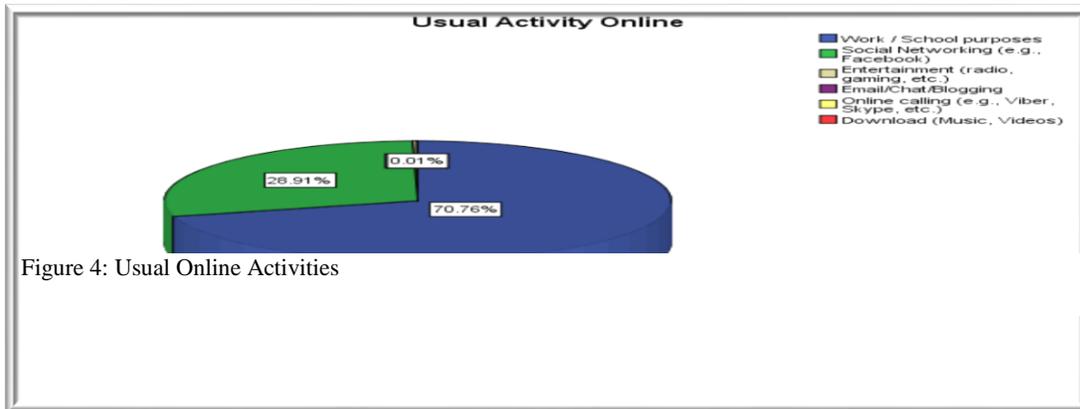


Figure 4: Usual Online Activities

Figure 85: Usual Activity Online

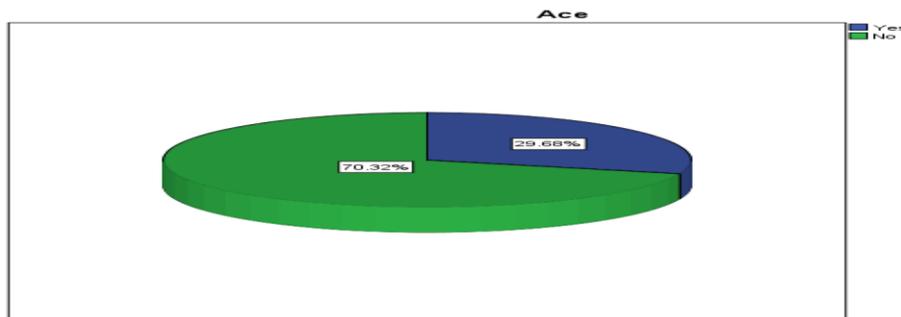


Figure 96: ACE Awareness

ACE AWARENESS

A little over 70% of respondents claimed that they do not know about ACE. This highlights the need for public education regarding ACE, which may be packaged with internet user education on rights, expectations, responsibilities and internet safety.

Perceived Effects of ACE since Launching

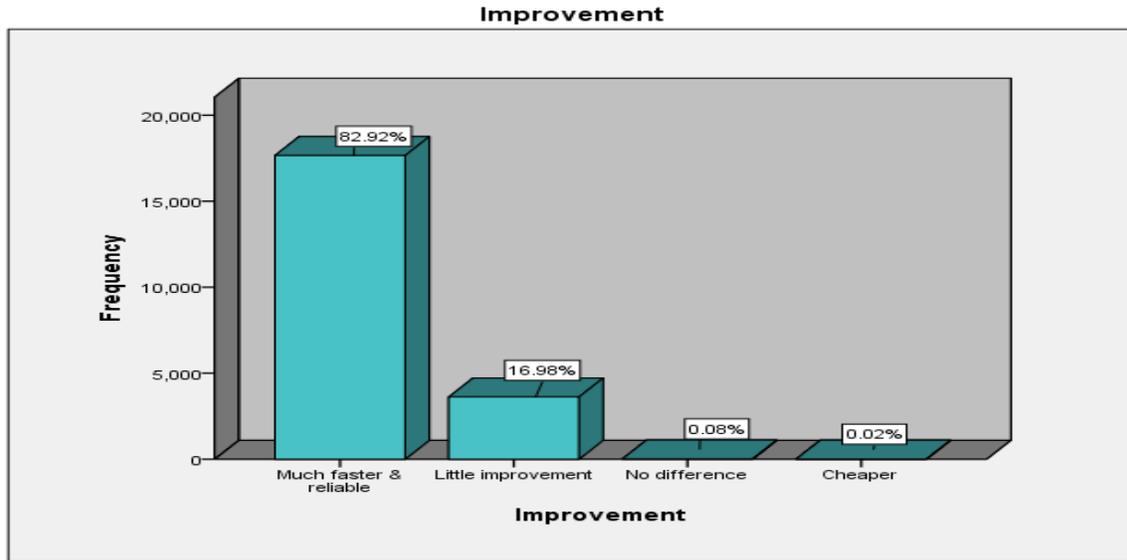


Figure 10: Perceived Effects of Ace

A total of 82.92% of users noticed much faster and reliable internet services since the ACE commissioning. A significant 16.98% expressed that there are little improvement.

Rate Your Mobile Services

Network Availability

Participants were also asked to indicate if they experience coverage issues. The response of the consumers is presented in Figure 11.

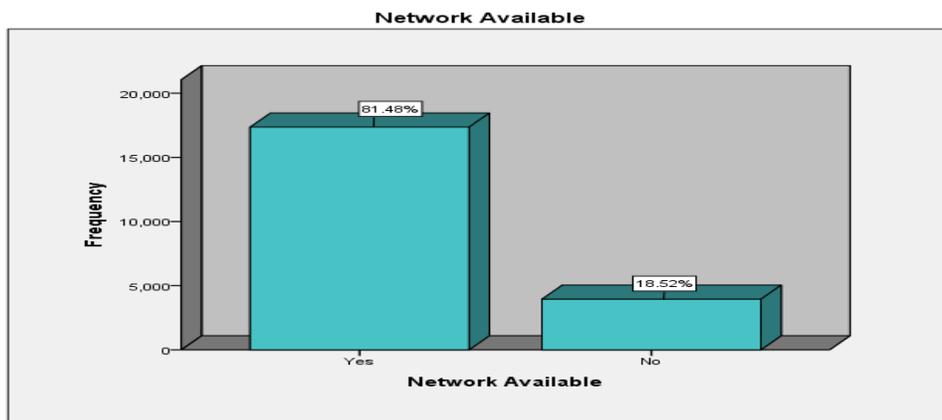


Figure 11: Network Availability

Over 80% of respondent claimed they do not encounter problems with network unavailability. This high percentage is clear indication that most of the consumer do not encounter network availability related issues.

Accessibility

Respondent were asked to measure how accessible is service providers network. The response from respondent is presented in figure 12.

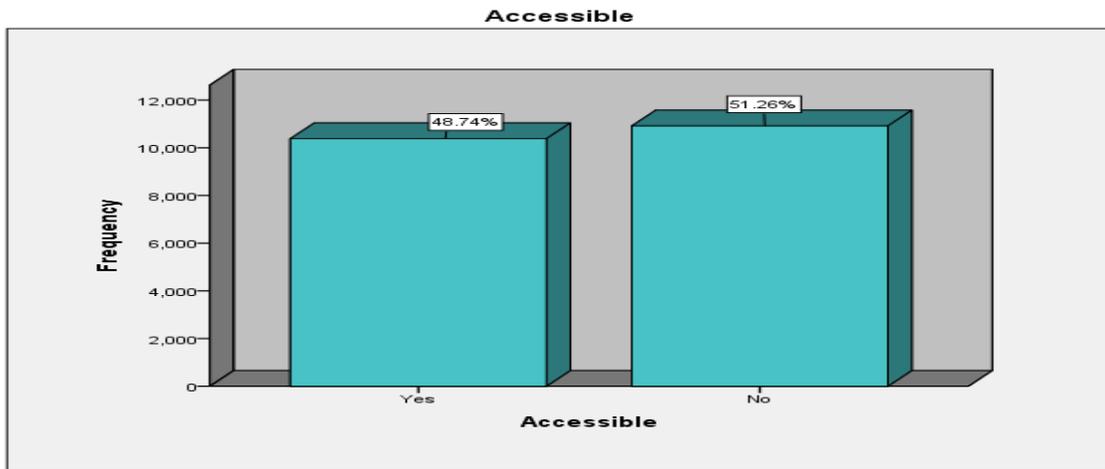


Figure 12: Accessibility

About 52% of survey participant claimed that the networks of service provide is not accessible.

Retainability

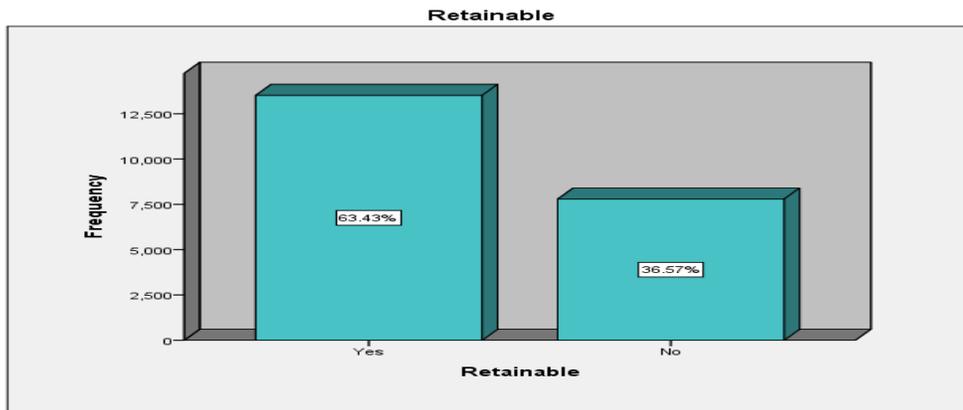


Figure 73: Retainable

Over 60% of respondent expressed their satisfaction in retaining calls on their operators' network. There is still room for improvement between consumer expectations and service providers, even though 60% of respondents expressed satisfaction with network retainability.

Affordability

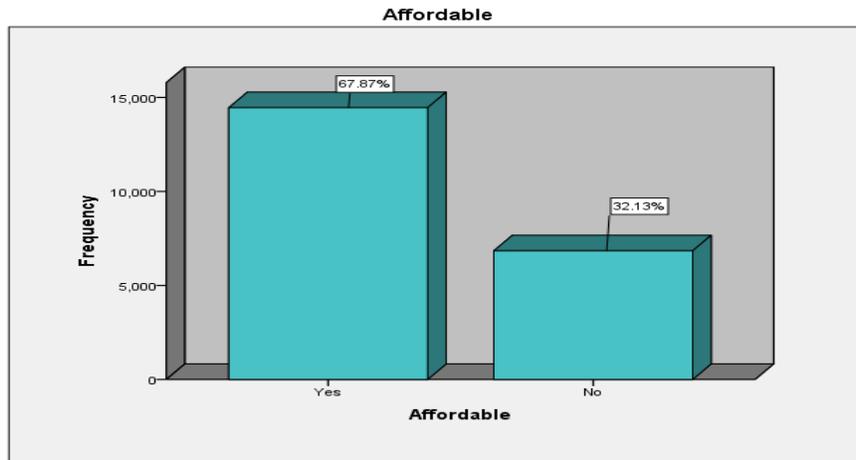


Figure 84: Affordable

Over 67% of respondent claimed that mobile services are affordable. However, 32% of the respondent claim that services are still not affordable. This is quite significant and alarming.

Rate your Internet Services

Reliability

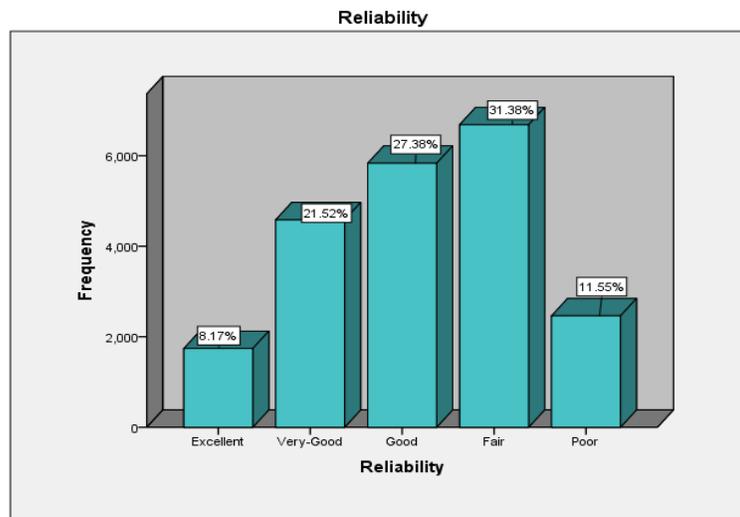


Figure 15: Reliability

The above survey result indicates that respondents have a generally fair impression of their service providers, with only 11% as “Poor”.

Speed

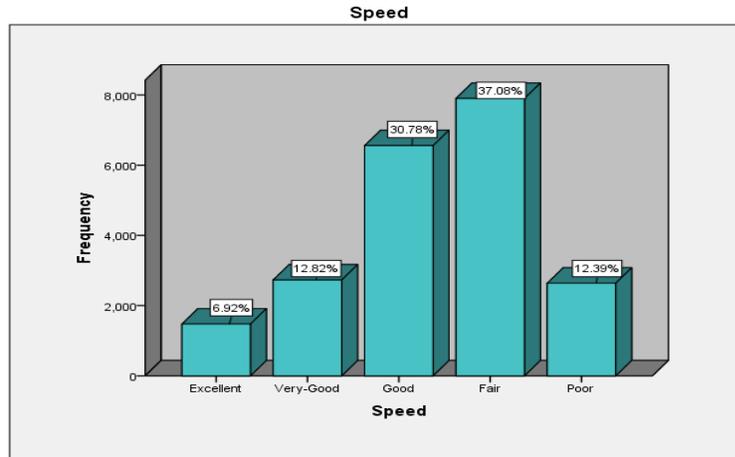


Figure 16. Speed

Most of the survey participants indicated that the network speed fair. However, about 30% percent of the respondent claim that the network speed is good. Only 12.39% indicated that the network speed is poor.

Busy signals

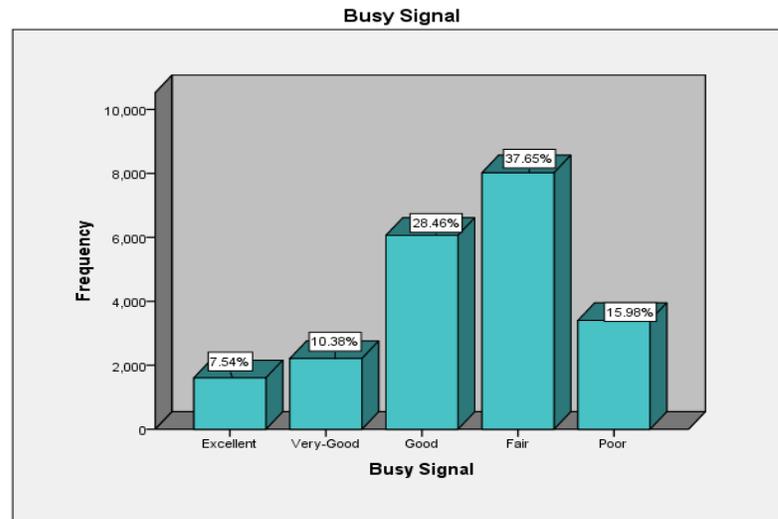


Figure 17: Busy Signal

Busy signal is also following the pattern of speed and reliability. Over 37% of respondent thing busy signal is fair, 28.46% respondent that busy signal is good, meaning busy signal is usually not a problem.

Disconnects

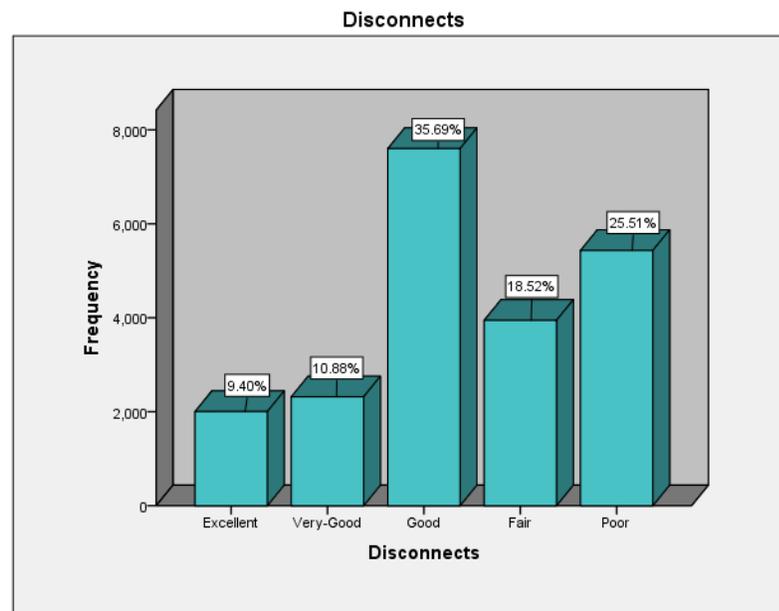


Figure 18: Disconnects

Over 35% of the survey respondent indicated that the rate of internet service disconnection is good. This implies that respondents do not experience a lot disconnections when using this service.

Recommendations

- ❖ Endorse policies that encourage and support girls' use of ICTs, primarily in educational institutions but also in workplaces and professional bodies. Make girls' and women's access to ICTs, and particularly broadband, a key pillar of the national development agenda, to narrow the gap in terms of access to and use of technology.
- ❖ Embark on more publicity and awareness campaign about ACE. This will have the two-fold effect of stimulating demand due to awareness of possibilities available, while encouraging consumers to hold ISPs to better quality of service. Increased demand, when it translates into increased subscriptions, will drive consumer prices down further.
- ❖ Continue to encourage and invest in ICTs and digital e-skills as a veritable engine of economic growth and development.

❖ Support the regulator's efforts to improve and enforce Quality of Service performance. This should be accompanied by consumer protection, privacy regulations, interoperability, security etc.

❖ Initiating and encouraging community-based projects in partnership with service providers, regulators and other investor's government initiatives can go a long way towards bridging the internal geographic and gender ICT divide.

Annex 12. Map

