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PROJECT PERFORMANCE ASSESSMENT REPORT

WHAT WORKS

CAMEROON, CHAD, CENTRAL AFRICAN REPUBLIC,
SÃO TOMÉ AND PRÍNCIPE

Internet and Mobile Connectivity:

Central African BackBone Program (APL 1A and APL 2)

Report No. 126034
JUNE 4, 2018

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Report No.: 126034

PROJECT PERFORMANCE ASSESSMENT REPORT

Cameroon, Chad, Central African Republic,

CENTRAL AFRICAN BACKBONE PROGRAM (APL 1A)
(IDA-46470, IDAH5150, IDA-H5160)

São Tomé and Príncipe

CENTRAL AFRICAN BACKBONE PROGRAM (APL 2)
(IDA-H6420)

June 4, 2018

Financial, Private Sector, and Sustainable Development
Independent Evaluation Group

Currency Equivalents (annual averages)

Currency Unit = Central African Franc (CFAF)

2009	US$1.00	CFAF 467
2010	US$1.00	CFAF 508
2011	US$1.00	CFAF 454
2012	US$1.00	CFAF 520
2013	US$1.00	CFAF 504
2014	US$1.00	CFAF 490
2015	US$1.00	CFAF 590
2016	US$1.00	CFAF 590
2017	US$1.00	CFAF 580
2018	US$1.00	CFAF 530

Currency Unit = São Tomé and Príncipe Dobra (Db)

2010	US$1.00	Db 18568
2011	US$1.00	Db 17160
2012	US$1.00	Db 19570
2013	US$1.00	Db 18850
2014	US$1.00	Db 19669
2015	US$1.00	Db 22450
2016	US$1.00	Db 21902
2017	US$1.00	Db 20538
2018	US$1.00	Db 19857

Fiscal Year

Central African Republic Government:	January 1 - December 31
Cameroon Government:	January 1 - December 31
São Tomé and Príncipe Government:	January 1 - December 31
Chad Government:	January 1 - December 31

Abbreviations and Acronyms

ACE	Africa Coast to Europe Optical Fiber Submarine Cable
AFAP	Agência Fiduciária de Administração de Projecto (Fiduciary Agency for Project Administration)
AfDB	African Development Bank
ADETIC	Agence de Développement des Technologies de l'Information et de la Communication (Agency for the Development of ICT, Chad)
AGER	General Regulation Agency
ANTIC	Agence Nationale des Technologies de l'Information et de la Communication (National Agency for Information and Communications Technologies, Cameroon)
APL	Adaptable Program Loan
ARCEP	Autorité de Régulation des Communications Electroniques et des Postes (Regulatory Authority for Electronic Communications and Posts, Chad)
ART	Agence de Régulation des Télécommunications (Telecommunications Regulatory Agency, Cameroon and Central African Republic)
CAB	Central Africa Backbone
CAMTEL	Cameroon Telecommunications
CAS	Country Assistance Strategy
CEMAC	Communauté Economique et Monétaire des Etats de l'Afrique Centrale (Central African Economic and Monetary Community)
CST	Companhia São Tomense de Telecomunicações
DSL	digital subscriber line
GDP	gross domestic product
GNI	gross national income
ICR	Implementation Completion and Results Report
ICT	information and communication technology
IDA	International Development Association
INIC	National Institute of Innovation and Knowledge
IRR	internal rate of return
ISR	Implementation Status and Results
ITU	International Telecommunications Union
IXP	Internet Exchange Point
Mbps	megabits per second
M&E	monitoring and evaluation
MINPOSTEL	Ministère des Postes et Télécommunications (Ministry of Posts and Telecommunications, Cameroon)
MoPWNR	Minister of Public Works and Natural Resource
MTR	Mid-term Review
PCU	Project Coordination Unit
PDO	project development objective
PPP	public-private partnership
RIAS	Regional Integration Assistance Strategy for Africa
SOCATEL	Société Centrafricaine de Télécommunications (Central African Telecommunications Company)
SOTEL	Société des Télécommunications du Tchad (Telecommunications Company of Chad)
SPV	Special Purpose Vehicle
UNITEL	UNITEL International Holding BV
USF	Universal Service Fund
WARCIP	West Africa Regional Connectivity Infrastructure Program

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This report was prepared by Kavita Mathur and Ebru Karamete, who assessed the projects in November 2017–February 2018. The report was peer reviewed by Anca Cristina Dumitrescu and panel reviewed by Fernando Manibog. Richard Kraus provided administrative support.

Principal Ratings

Central Africa Backbone APL 1A (P108368)

	ICR*	ICR Review*	PPAR
Outcome	Moderately Satisfactory	Moderately Satisfactory	Unsatisfactory
Risk to Development Outcome	Modest	Modest	Substantial
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory
Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory

* The Implementation Completion and Results (ICR) report is a self-evaluation by the responsible global practice. The ICR Review is an intermediate IEG product that seeks to independently validate the findings of the ICR.

Central Africa Backbone APL 2 (P117652)

	ICR*	ICR Review	PPAR
Outcome	Highly Satisfactory	Highly Satisfactory	Satisfactory
Risk to Development Outcome	Negligible to Low	Negligible to Low	Substantial
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Moderately Satisfactory

* The Implementation Completion and Results (ICR) report is a self-evaluation by the responsible global practice. The ICR Review is an intermediate IEG product that seeks to independently validate the findings of the ICR.

Key Staff Responsible

Central Africa Backbone APL 1A

Project	Task Manager/Leader	Division Chief/ Sector Director	Country Director
Appraisal	Jerome Bezzina	Philippe Dongier	Mary A. Barton-Dock
Completion	Jerome Bezzina	Boutheina Guermazi	Rachid Benmessaoud

Central Africa Backbone APL 2

Project	Task Manager/Leader	Division Chief/ Sector Director	Country Director
Appraisal	Maria Isabel A. S. Neto	Philippe Dongier	Yusupha B. Crookes
Completion	Maria Isabel A. S. Neto	Randeep Sudan	Colin Bruce

IEG Mission: Improving World Bank Group development results through excellence in independent evaluation.

About this Report

The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the World Bank's self-evaluation process and to verify that the World Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20–25 percent of the World Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or World Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, interview World Bank staff and other donor agency staff both at headquarters and in local offices as appropriate, and apply other evaluative methods as needed.

Each PPAR is subject to technical peer review, internal IEG Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible World Bank country management unit. The PPAR is also sent to the borrower for review. IEG incorporates both World Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the World Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the IEG Rating System for Public Sector Evaluations

IEG's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: http://ieg.worldbankgroup.org).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current World Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, and Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension is not applied to development policy operations, which provide general budget support. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High, Significant, Moderate, Negligible to Low, Not Evaluable.

World Bank Performance: The extent to which services provided by the World Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Preface

This is a Project Performance Assessment Report (PPAR) by the Independent Evaluation Group (IEG) of the World Bank Group on the following two projects:

- **Central African Backbone Project APL 1A in Cameroon, Central African Republic and Chad.** The World Bank Group Board of Directors approved the project on September 24, 2009, for a cost of US$26.2 million, with an International Development Association (IDA) credit of US$9.9 million and IDA grant of US$16.3 million. The project cost at completion was US$24.2 million, with US$9.4 million of the IDA credit and US$14.9 million of the IDA grant used. The project closed on March 15, 2016 as scheduled. The objectives of the project were to help to increase the geographical reach and usage of regional broadband network services and reduce their prices. The project's intended design during the preparation stage included a focus on leveraging the Chad-Cameroon oil pipeline's fiber optic network to extend broadband into the landlocked countries of the Central African Republic and Chad and to form a core Central African Backbone (CAB) regional network; the project development objective mainly reflected this focus. Before the project's approval, the World Bank Regional Operations Committee decided to postpone the connectivity infrastructure investment component to the next phase (CAB APL 1B) and to include only the enabling environment technical assistance activities in this project, CAB APL 1A. However, the original project development objective for CAB APL 1A was not revised to reflect the change in project design for the first phase, largely enabling environment technical assistance activities. The investment part of the project (CAB APL 1B) was canceled before project effectiveness because countries had not fulfilled the effectiveness conditions.
- **CAB Project APL 2 in São Tomé and Príncipe.** The World Bank Group Board of Directors approved the project on January 20, 2011, for a cost of US$14.9 million, entirely financed by IDA grant. The project cost at completion was US$15.06 million. The project closed on December 12, 2014, as scheduled. The objectives of the project were to contribute to increase the geographical reach and usage of regional broadband network services and reduce their prices. The financing of the São Tomé and Príncipe contribution to the Africa Coast to Europe Optical Fiber Submarine Cable (ACE) on an "open access basis" through a public-private partnership arrangement would provide a much-needed connectivity to broadband internet and mobile services, and would contribute to the project objectives of increasing geographical coverage and reduction in prices, thereby leading to increased usage. The project's technical assistance supported the creation of the enabling environment for the development of the information and communications technology (ICT) sector in São Tomé and Príncipe.

IEG selected these projects for performance assessment for two reasons: (i) as contributions to IEG's upcoming evaluation on Fostering Regional Integration; and (ii) to address the ICT sector evaluative gap because the sector is underrepresented in the PPAR portfolio. IEG visited Cameroon and Chad in November-December 2017 to assess CAB APL 1A. No mission was conducted in the Central African Republic because of security concerns, but the country team provided current data. IEG conducted a desk review of

CAB APL 2, and, with the support of a local expert, interviewed stakeholders in the country through teleconference meetings.

This PPAR is based on a review of all relevant documentation, interviews with World Bank staff at headquarters and in the country office, and discussions with officials of the government, the implementing agency, and other key stakeholders. The list of persons met during the mission is attached in Appendix C. Their cooperation and assistance in preparing the report is gratefully acknowledged.

Following standard IEG procedures, copies of the draft PPAR were sent to the government officials and implementing agencies for their review. No comments were received from the Borrower.

Summary

This Project Performance Assessment Report (PPAR) assesses the development effectiveness of the Central Africa Backbone Project Adaptable Program Loan (APL) 1A implemented in three countries: Cameroon, Central African Republic and Chad; and the Central Africa Backbone Project APL 2 implemented in São Tomé and Príncipe.

Central Africa Backbone Project APL 1A (Cameroon, Central African Republic and Chad)

During the late 2000s, Central African countries were suffering from limited access and high costs of information and communication technology (ICT) services. There were several hindrances affecting the sector including the isolation of the countries, incomplete market liberalization, and the absence of backbone infrastructure at the national level. Most telecommunications operators in the region did not have broadband terrestrial networks and relied on expensive and poor-quality satellite connectivity to link cities at the national level. Central African countries, in particular landlocked ones, realized that without cross-border initiatives individual countries would not achieve low-cost broadband access and advance their growth agenda and global competitiveness.

In May 2007, the heads of state of the Communauté Economique et Monétaire des Etats de l'Afrique Centrale (CEMAC) adopted a Declaration calling for the establishment of the Central African Backbone Program (CAB) under open access and public-private partnership (PPP) principles, and asked for financial assistance from donors.

CAB APL1 was originally designed as one International Development Association (IDA)–financed operation covering Chad, Cameroon, and the Central African Republic, and encompassing sector-level legal and regulatory reforms, the establishment of a regional PPP entity to manage the future CAB infrastructure, and the construction of backbone links to neighboring countries. However, before the project became effective, CAB APL 1 was split into two vertical APL phases: a first phase (CAB APL 1A) to support the strengthening of the enabling environment, and a second phase (CAB APL 1B) to support the investment for the infrastructure PPP. However, though the project objectives remained unchanged, CAB APL 1B was canceled before effectiveness, because the participating countries did not meet effectiveness conditions. Therefore, this assessment only includes the CAB APL 1A project.

Project Performance and Ratings

The objectives of the project were to help to increase the geographical reach and usage of regional broadband network services and reduce their prices to end-users.

The **relevance of the project objectives** is rated ***high***. The project objectives were fully consistent with the country strategies of Cameroon, the Central African Republic, and Chad. The current Country Partnership Framework (FY17–21) in Cameroon included improving telecoms by developing a more open and competitive regulatory framework to attract private telecoms investment. The current Country Partnership Framework (FY16–20) for Chad mentioned poor communications infrastructure as an important deterrent to

private sector investment. The Country Partnership Strategy for the Central African Republic (FY09–12) stressed the need to ease infrastructure bottlenecks (including those in ICT) that were hindering the development of key sectors and improvements in infrastructure supporting regional economic integration. In the regional context, the objectives were consistent with the World Bank's *Regional Integration Assistance Strategy for Africa* (RIAS 2004). The first pillar of RIAS stressed the development of regional infrastructure, especially telecommunications, to strengthen regional interconnectivity and to reduce costs.

The **relevance of project design** is rated ***modest*** because project activities were not causally linked to achievement of the project objectives. The project's design during the preparation stage included a focus on leveraging the Chad-Cameroon oil pipeline's fiber optic network to extend broadband into the landlocked countries of the Central African Republic and Chad, and to form a core CAB regional network. The project development objective (PDO) mainly reflected this focus. Although the World Bank Regional Operations Committee decided to postpone the connectivity infrastructure investment to the next phase, the project team did not revise the initial PDO to reflect this change in the scope of project activities. Thus, while the enabling environment technical assistance is a necessary condition (that is, modernizing the policy, legal and regulatory framework; strengthening the capacity of key public stakeholders, promoting a competitive environment, restructuring incumbent operators, and improving the technology), it was not sufficient to fully achieve the unchanged PDO.

The **project's achievement of all three objectives—increasing the geographical reach**, **increasing the usage of regional broadband network services,** and **reducing their prices**—is rated ***modest***.

The project outcome indicators measuring the objectives in general exceeded the targets. However, the enabling environment technical assistance activities under this project are not sufficient on their own to fully achieve the project objectives:

> *First*, the achievements shown under the outcome indicators cannot be fully attributed to the project activities because there were other exogenous factors at play, such as the rapid growth of ICT globally. Moreover, key interconnectivity infrastructure investments that would significantly contribute to the project outcomes were financed by other donors or countries themselves, while partially adhering to the CAB Program's intended principles of open access, developing wholesale markets, and promoting public-private partnership.
>
> *Second*, the project did not envisage use of most of the studies, which weakened the impact of technical assistance activities on the outcomes.
>
> *Third*, the project's goal of restructuring incumbent operators was not achieved, and ICT markets remain dominated by inefficient incumbent operators adversely affecting quality, price, and usage of ICT services in all three countries.
>
> *Fourth* the usage of ICT services, particularly internet services, is still low in all three countries, particularly Chad and the Central African Republic. In addition,

internet prices are still very high and not affordable in these countries; the Central African Republic CAR has the highest "internet price" by "per capita gross national income " (GNI) among 182 countries in the world, followed by Chad in 2016 (for example, according to the International Telecommunications Union, fixed broadband price in the Central African Republic as a percentage of GNI is 1,836 and in Chad it is 613, whereas this price is less than 1 percent for many developed countries). While the mobile broadband prices are more affordable compared to fixed internet prices, they are still expensive particularly for Chad. No figures were available for Central African Republic. Mobile broadband figures measured as "500 MB / GNI in percentage" are as follows: - for Chad 11.5 percent, for Cameroon 3.1 percent, Africa average 9.3 percent and the World average is 3.7 percent.

The **project efficiency** is rated ***modest***. This is mainly because of high administrative and operational inefficiencies reflected in high project management costs; fiduciary issues (particularly in Chad).

The **project outcome** rating (of this CAB APL 1A project) is ***unsatisfactory***, based on the combination of *high* relevance of objectives and the *modest* relevance of design, the *modest* achievement of all three development objectives (to increase geographical reach and usage of regional broadband network services, and to reduce their prices), and the project's *modest* efficiency.

The **risks to development outcome** are rated ***substantial***. There has been some progress in the regulatory framework through enactment of telecommunications law and secondary regulation. Nevertheless, the regulatory agencies are still weak in all three countries and need further support. In addition, the incumbent operators need to be restructured, which the project attempted but eventually dropped. The lack of political will may inhibit the restructuring, which would halt the progress of the ICT sectors, particularly in Cameroon.

The World **Bank's performance** is rated ***moderately unsatisfactory*** This was a complex project implemented in a challenging environment. Despite the major shortcomings at quality at entry, as explained below, the quality of supervision was moderately satisfactory, considering the constant dialogue, numerous technical discussions and proactive support by the Bank team to the client during implementation.

Although the regional program was based on lessons from regional operations in Africa, and the World Bank team brought together different development partners, there were several design issues:

First, project preparation took two years, but additional time was needed to get the political commitment about the reforms and improved policies in the sector. The splitting of the project into two phases was motivated partly so as to include the first phase in the IDA15 commitments. However, the rush made it difficult to get commitment from the participating countries to carry out the difficult reforms (establishment of regional PPP, restructuring of incumbent operators).

Second, there were shortcomings in monitoring and evaluation (M&E). The outcome indicators were focused on activities associated with investments in the regional ICT infrastructure, and hence not appropriate for monitoring the technical assistance activities eventually financed by the project. In addition, no outcome- and intermediate outcome–level indicators were designed to monitor and evaluate the impact of the technical assistance activities of the project, such as quality of technical assistance, use of studies, and intended behavior change. The World Bank team did not attempt to revise the PDO with relevant indicators to adequately measure the project results during implementation.

The **Borrowers' performance overall** is rated ***moderately unsatisfactory***. Although the performance of Central African Republic was moderately satisfactory, there were major shortcomings with the performance of Government of Chad and Cameroon regarding the project, therefore the overall rating becomes moderately unsatisfactory. The Government of Chad provided inconsistent commitment to the project in the early stages, although it improved after the midterm review when nine new laws related to electronic communications were passed. Cameroon was supportive in general, although relevant reforms regarding restructuring of the incumbent operator were not pursued. The Central African Republic remained largely supportive throughout the project, but because of the security difficulties and their aftermath between 2012 and 2014, the enactment of the regulations was delayed.

In Cameroon, there was inconsistent support from the Minister of Post and Telecommunications, the implementing agency, regarding some of the reforms to be carried out under the project, particularly the restructuring of Cameroon Telecommunications (CAMTEL). In Chad, overall leadership by the main government implementing agency was weak. Both the line Ministry and the other implementing agencies had difficulties following the World Bank's rules. The Project Coordination Unit (PCU) had significant weaknesses in financial management, and the forensic analysis found ineligible expenses charged to the project. With the appointment of a new PCU, financial management improved substantially. In the Central African Republic, there were some challenges at the beginning of the project because of a high turnover of ministers; however, the PCU carried out all its functions in a highly professional manner throughout the project.

Central Africa Backbone Project APL 2 (São Tomé and Príncipe)

São Tomé and Príncipe was among a handful of countries in the region that was not connected to the global network of broadband optical fiber infrastructure. The Africa Coast to Europe (ACE) optical fiber submarine cable was the only viable option to enhance the country's international connectivity.

Project Performance and Ratings

The objectives of the project were to help to increase the geographical reach and usage of regional broadband network services and reduce their prices.

The **relevance of the project objectives** is rated ***high***. The project objectives are fully consistent with the World Bank's current Country Partnership Strategy (FY14–18),

which aimed at “supporting macroeconomic stability and national competitiveness” through improved regional broadband connectivity.

The **relevance of the project design** is rated ***high***. The project design was comprehensive and was therefore expected to fully deliver the outcomes because the financing of the São Tomé and Príncipe contribution to the ACE submarine cable would provide the much-needed connectivity to broadband internet and mobile services, and would contribute to the project objectives of increasing geographical coverage and reducing prices, thereby leading to increased usage. The project’s technical assistance activities on strengthening the legal and regulatory capacity, and launching a second mobile telecommunications operator to increase competition, could also be expected to contribute to the project objectives of reduction in prices and increased usage.

The **objectives** of **increasing the geographical reach** and **usage of regional broadband network** and **reducing its price** are all rated ***substantial***. The connection to the ACE submarine cable, and the tendering of the second mobile operator license to UNITEL International Holding BV (UNITEL), led to an increase in international internet bandwidth, and reduction in the cost of international connectivity (wholesale and retail price). However, the internet retail price is still very high relative to income levels (almost 20 percent of the average monthly income compared to less than 1 percent for many developed countries). Another shortcoming was the lack of adoption of the ICT Strategy and modifications to the Telecom Law prepared under the project that affected further expansion of the sector, particularly usage.

The **project efficiency** is rated ***substantial.*** Financial rates of return were calculated both at project appraisal and at project closure using similar methods. Both the ex-ante and ex-post financial internal rate of return were estimated at 19 percent. The project did not experience any cost or time overruns. The project generated US$8 million of revenues for the government through the sale of STP-Cabo shares and the awarding of the second license to UNITEL.

The **outcome** rating (of CAB APL 2 project) is rated ***satisfactory*** based on high relevance of objective and design; substantial achievement of all three objectives—increased geographical reach and usage of broadband network, reduction in price, and substantial project efficiency.

The **risk to development outcome** is rated ***substantial*** because of the lack of adoption of the ICT strategy and regulatory framework developed under the project, the country’s small market size, the high cost of internet services, and the lack of competition limiting the further growth of the sector and thereby future reduction in prices.

The **World Bank’s performance** is rated ***satisfactory.*** Project design reflected lessons from previous projects and analytical work. The project team successfully assisted government in the negotiations that resulted in São Tomé and Príncipe's fruitful participation in the ACE consortium, while ensuring the principles of open access to cable capacity for future operators. The project was adequately supervised and the World Bank team responded adequately to project demands.

The **Borrower's performance** is rated ***moderately satisfactory***. The government was fully committed to the project, as shown by the award of the second mobile operator license and successful implementation of a PPP through open access principle for the ACE submarine cable. The government failed to adopt the ICT strategy and other legislation prepared through the project's Technical Assistance. The Project Implementation Unit generally performed its functions well, albeit sometimes with delays in procurement. However, the authorities complied with Bank's fiduciary and safeguards policies.

Lessons

- **A thorough political economy assessment and high-level national and regional commitment are key ingredients for complex regional ICT projects.** The experience of CAB APL 1A illustrates that ICT reforms are politically difficult to implement because of the resistance and influence of incumbent operators. A thorough analysis of the political economy in all countries is a critical tool to use during project preparation. It is essential that the political economy assessment identifies high-level national champions (at senior positions close to the level of the President or Prime Minister) who can overcome political economy challenges. Commitment to the necessary reforms should be confirmed with official agreements. In addition, a communication campaign on planned reforms during project preparation and implementation, to sensitize stakeholders and get their continuous buy-in, is essential.

- **The experience from the Central Africa Backbone APL 1 and 2 project shows that public private partnership arrangements are difficult to implement in multiple countries, particularly when countries have asymmetrical needs and incentives with respect to increasing competition for the provision of international and national capacity.** In CAB 1B, Cameroon perceived the regional PPP as an option imposed by the World Bank from above, considering it as an infringement on their sovereignty; consequently, they rejected the approach. This was also partially because Cameroon had less incentive to take part in the regional PPP, because it already had access to submarine cables and most of its national backbone was already built. Therefore, Cameroon withdrew its participation in the second phase of the project. Chad followed Cameroon and proceeded to have its national backbone built under a separate contract, creating a separate company in early 2012 to manage its fiber optic network in direct contradiction to the regional PPP envisaged under the project. On the other hand, in CAB APL 2, the existence of an upstream regional multi-country project (the Africa Coast to Europe-ACE) connecting up to 23 countries, facilitated the effective connection and implementation of public private partnership arrangement in São Tomé and Príncipe. This was achieved as the implementation happened separately within each country jurisdiction based on regionally agreed parameters.

- **Technical assistance for the preparation of legislation and sector strategies is only the first step to creating an enabling environment for the ICT sector.** The technical assistance can be effective if projects include sufficient resources to adopt legislation and strategies. In CAB APL 1A, there was a need for additional funds to

implement the result of the studies developed by the project technical assistance. In Cameroon, for example, the regulatory agencies had to look for additional resources to implement some of the study recommendations.

- **Assessing and funding the capacity needs of Regional Economic Communities is important for project coordination and implementation, so that they can carry out their functions effectively**. Regional institutions perform important roles, such as convening countries and securing their political commitment; helping them take collective decisions; playing an advocacy role; and performing M&E functions at the regional level. The project experience showed that CEMAC was effective during project design and negotiations but lacked capacity during implementation, particularly on M&E. The World Bank could have supported its needs to better utilize the influencing and coordinating power of this institution.

- **In weak capacity environments, it is beneficial that the projects build the needed institutional capacity for the Borrower to further / implement the crucial reforms and to ensure sustainability of the investments in the country.** For example, in APL2**,** the prepared regulations and ICT strategy were not adopted after the project was closed. In addition, although the project connected schools to the internet through 'last mile' investments with planned O&M activities, lack of institutional capacity for monitoring and follow up made the results unsustainable.

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1. Background and Context

1.1 Information Communication Technologies (ICTs) have a positive impact on economic growth. It is estimated that a 10 percent increase in telephone subscriptions per 100 people contributes to 0.6 percent GDP growth around the world, and every 10-percentage point increase in broadband subscriptions per 100 people is associated with 1.38 percentage points additional GDP growth in developing countries.[1] Access to information and communications technology contributes to boosting economic productivity, raising incomes of families and small businesses, and providing an important source of government revenue. ICT helps to improve the quality and efficiency of public service delivery.

1.2 During late 2000s, Central African countries were still suffering from limited access and high costs of ICT services. Among the challenges affecting the sector were the countries' isolation, their incomplete market liberalization, and the absence of backbone infrastructure at the national level. Most telecommunications operators in the region did not have broadband terrestrial networks and relied on expensive and poor-quality satellite connectivity to link cities at the national level. Central African countries realized that without cross-border initiatives, the individual countries would not be in a position to achieve low-cost broadband access and advance their growth agenda and overall global competitiveness. Landlocked countries in Central Africa were especially disadvantaged because they need to interconnect with incumbents or national long-distance operators in intermediary countries to carry traffic to a submarine cable landing point, for which they would often would pay high prices.

1.3 International tariffs for landlocked countries like the Central African Republic and Chad, which were exclusively using satellites, were about 50 times higher than in countries with connections to competitive fiber-optic submarine cables. Fixed teledensity (defined as the number of fixed telephone lines per 100 inhabitants) in the Central African countries was on average 1.24 percent lines as compared to the Sub-Saharan Africa average of 1.82 percent. Mobile density (defined as the number of mobile subscriptions per 100 inhabitants) varied widely among the Central African countries: 24.48 percent in Cameroon, 2.99 percent in the Central African Republic and 8.53 percent in Chad, and 62 percent in São Tomé and Príncipe, as compared to the Sub-Saharan Africa average of 22.79 percent and the world average of 49.79 percent[2].

1.4 The ICT sectors in each of these three African countries were dominated by a state-owned incumbent operator. For Cameroon, this was Cameroon Telecommunications (CAMTEL), which the government had twice failed to privatize prior to appraisal. In the Central African Republic, the incumbent is the Société Centrafricaine de Télécommunications (Central African Telecommunications Company or SOCATE) and in Chad it is the Société des Télécommunications du Tchad (Telecommunications Company of Chad—SOTEL), which are both "distressed operators" with chronic operating losses, given their low market share in a globally competitive sector.

1.5 São Tomé and Príncipe was among a handful of countries in the region which were not connected to the global network of broadband optical fiber infrastructure. Small states in the region were often bypassed by submarine cable consortia, because their markets

were not attractive enough for investment. For purposes of international connectivity, a viable option for West African countries was to connect to the ACE optical fiber cable, a submarine cable system anticipated to be approximately 17,000 km long. ACE was intended to connect South Africa to Europe, potentially connecting up to 23 countries, either directly for coastal countries or indirectly through terrestrial links. Other submarine cables existed at the time (for example, SAT3, SAFE, WACS), but with closed consortia or monopolistic models, and none of them connected São Tomé and Príncipe.

1.6 Based on the findings of a 2007 Public-Private Infrastructure Advisory Facility (PPIAF)-funded feasibility study undertaken by an international consultancy firm that met with stakeholders on ICT in May 2007, the heads of state CEMAC adopted a Declaration calling for the establishment of the Central African Backbone Program (CAB) under open access and public-private partnership (PPP) principles, and asked for financial assistance from donors. Cameroon, Chad, and the Central African Republic were selected for the first phase in order to leverage the existing fiber optic network laid along the Chad-Cameroon oil pipeline and extend it further into the landlocked countries of the Central African Republic and Chad.

1.7 **Regional PPP Structure[3]:** The CAB structure called for the establishment of new regional telecom operator(s) for reselling international, regional, and national capacity to existing national operators and service providers at lower prices than current pricing in the targeted countries. Key principles that were defined in the study and that all participating countries had to endorse to be eligible for World Bank financing included promoting open access (see box 1.1 for explanation) regimes, developing wholesale markets, and promoting PPP.

1.8 This regionally oriented structure was the first of its kind for the ICT sector in Sub-Saharan Africa and would increase competition for the provision of international and national capacity. Governments and the private sector would actively participate in the CAB program through investments and incentives. Up to seven other countries were planned to join in subsequent phases of the program depending on their interest, readiness, and availability of funding. The CAB program was designed to be a regional and fully integrated end-to-end backbone infrastructure network linking several Central African countries and providing digital broadband access to the global fiber optic network. CAB APL 1 covered Cameroon, Chad and the Central African Republic; CAB APL 2 covered São Tomé and Príncipe, CAB APL 3 covered the Republic of Congo, CAB APL 4 covered Gabon, and CAB APL 5 focused on the Democratic Republic of Congo.[4] The CAB program was structured as both a horizontal and vertical APL.[5]

Project Context on CAB APL 1

1.9 **CAB APL1 Project Split into Two Phases APL 1A and 1B:** CAB APL 1 was initially designed as one IDA-financed operation covering Chad, Cameroon, and the Central African Republic, and encompassing sector legal and regulatory reforms, the establishment of a regional PPP entity to manage the future CAB infrastructure, and the construction of backbone links to neighboring countries. Before the project became effective, during the meeting of the World Bank Regional Operations Committee on April 23, 2009, it was decided to split CAB 1 into two phases: a first phase (CAB APL 1A) to

support the strengthening of the enabling environment, and a second phase (CAB APL 1B) to support the investment for the infrastructure PPP. The Regional Operations Committee based its decision on the client's lack of readiness to implement a PPP structure. CAB APL 1A was then scheduled for Board approval in July 2009, whereas CAB APL 1B was postponed allowing more time for preparation and appraisal of the PPP. The first phase, CAB APL1A project, was subsequently approved by the Board on September 24, 2009, and became effective on February 12, 2010.

1.10 **CAB APL 1B (P116542 -Canceled).** As mentioned before, the first phase aimed at creating an enabling environment for developing the ICT sector in the three project countries. The second phase, to be triggered once the effectiveness conditions were met, envisaged regional investments in connectivity infrastructure through a regional PPP model, which was formally agreed in the Central African Republic and Chad. Cameroon, having already reached agreement to develop its own fiber-optic backbone infrastructure, opted for a standalone network with interconnection arrangements to the regional network infrastructure. It was therefore decided that CAB APL 1B would provide financing in the Central African Republic and Chad but not in Cameroon. Thus, the CAB APL 1B project aimed to develop a regional fiber-optic network that connected the Central African Republic and Chad to networks in Cameroon and Sudan through a PPP structure. The Private Partner would partly finance, build, own, and operate the network. CAB APL 1B was approved on June 30 ,2011. The project had two main components in each country: Component 1 would focus on connectivity, with funds for the public contribution to the PPP structure that would build and operate the regional fiber-optic network; and Component 2 would focus on project management and additional technical assistance. The PDO and outcome indicators were the same for both phases - CAB APL1A and 1B.

1.11 Because there was no formal commitment for important reforms by the countries, the World Bank included the following effectiveness conditions for the second phase APL 1B: (i) the establishment of a legal structure for managing the regional ICT network PPP arrangements and ensuring an open-access regime to regional connectivity infrastructure (meaning that all operators and service providers would have access to regional infrastructure under similar terms and conditions) by the two countries. and, (ii) the CAB legal structure should have the legal rights to operate the CAB network on the recipient's territory. As mentioned earlier, Cameroon had already withdrawn from participation in the second phase in November 2010 because it characterized the regional PPP structure as an imposition on its national sovereignty and decided to have its national backbone built under a separate contract. Right before the signing of the financing agreement in November 2011, Chad indicated that it was no longer willing to sign the negotiated financial agreement. Then in early 2012 Chad created a separate company to manage its fiber-optic network, in direct contradiction with the projected regional PPP. The World Bank liaised with the governments of Chad and the Central African Republic but no action was taken. Thus, the envisaged second phase of this project, CAB APL 1B, was cancelled on the date of the effectiveness deadline, December 15, 2012 because of the failure to meet the effectiveness conditions.

1.12 **Because the CAB APL 1B Project was canceled before effectiveness, this evaluation covers the CAB APL 1A Project.**

ICT Sector Value Chain

1.13 Both projects (APL 1A and APL 2) had the same project development objectives: increased geographical reach, increased usage of regional broadband network services, and reduced prices (See Objectives Sections). For APL 1 geographical reach and use of broadband would be achieved through the investment that would leverage the existing fiber optic network laid along the Chad-Cameroon oil pipeline, and extending it further into the landlocked countries of the Central African Republic and Chad. (However, as mentioned above this investment part was moved to a second phase (APL 1B) that never materialized). For São Tomé and Príncipe, the geographical reach would be achieved through connecting to the ACE submarine optical fiber cable system. These investments would also help to reduce wholesale and retail prices.

1.14 Price reduction is mainly a result of reduced gateway prices (international connectivity), the technology and availability of market competition (through availability of multiple international connections, as well as competition created through open access principle). Retail price additionally is a function of the number of users (as demand increases, retail price declines). So, increased usage and reduced retail prices mutually affect each other in a continuous manner. In addition, increased usage is a function of better quality of service (faster and continuous service) (See box 1.1 for details of ICT sector investments and policies).

Box 1.1. The ICT Value Chain

ICT broadband infrastructure coverage can be done through various technologies (such as fiber, wireless, satellite, microwave, etc.), but their speed, reliability, and cost differ widely. Fiber optic technology converts electrical signals carrying data to light and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps* (for details see Appendix B). Fiber optic backbone structures are defined as next-generation broadband technology because of their high and potential growing capacity.

The ICT supply-side value chain stretches from the point where the internet enters a country (the first mile), passes through that country (the middle mile) to reach the end user (the last mile), and certain hidden elements in between (the invisible mile). The first mile can be improved by liberalizing the market for satellite dishes and eliminating monopoly status over the international gateway and cable landing stations. Strengthening the middle mile involves liberalizing the market for building and operating backbone networks, encouraging open access to the incumbent's network, setting up internet exchange points, and creating local caches for frequently used content. Government policies can encourage the provision of last-mile connectivity by permitting competing facilities, especially for intermodal competition (between cable, wireless, and digital subscriber line (DSL)), and mandating that the incumbent make local access lines available to competitors at wholesale prices (local loop unbundling). The most critical portion of the invisible mile involves spectrum management, which requires increasing the amount of spectrum available, ensuring competitive access, encouraging sharing of essential facilities such as radio masts, and liberalizing the market for spectrum resale.

Open-access policies ensure that new competitors can enter and compete in broadband markets by requiring incumbent operators to lease access to their networks to their competitors at equal conditions, at regulated rates. By requiring that capacity be shared, through leasing with competitors, open-access rules are intended to encourage entry by those competitors, who can help

reduce prices and bring innovation into the sector. Incumbent operators tend to be politically powerful, and they generally resist implementation of open-access principles. Regulators should require incumbents to provide access to their network to other operators under regulated wholesale prices. Strong regulatory agencies are necessary to eliminate the incentives of the incumbents to discriminate among consumer broadband market providers in access to basic infrastructure.

* Megabyte per second.

Source: *World Development Report* 2016 on Digital Dividends; and Harvard University 2010 Report on Next-Generation Connectivity: A Review of Broadband Internet Transitions and Policy from Around the World.

2. Central Africa Backbone APL 1A (Cameroon, Chad, and Central African Republic)

Key sector issues

2.1 Cameroon's ICT sector was in a slightly more advanced state compared to Chad and the Central African Republic at the time of project preparation. It had international connectivity via submarine cable SAT3. Fixed teledensity (number of fixed telephone lines per 100 inhabitants) was 1.02 percent and a mobile teledensity (number of mobile subscriptions per 100 inhabitants) was 24.48 percent.[6] CAMTEL retained a monopoly over long-distance and is the main provider of most international bandwidth (international connectivity via sub-marine cable SAT3). Following the failed privatization of CAMTEL in 2008, due to resistance from the incumbent operator, the government had opted to restructure CAMTEL on the basis of a PPP. Two mobile operators were active, but mobile per-minute prices were high and user penetration was low. Other major sector issues included the need to harmonize the ICT institutional framework in Cameroon in order to provide coherence in the operations of the regulators Agence de Régulation des Télécommunications (Telecommunications Regulatory Agency or ART) and Agence Nationale des Technologies de l'Information et de la Communication (National Agency for Information and Communications Technologies or ANTIC), and the Ministry of Posts and Telecommunications (MINPOSTEL), and other sector stakeholders. Cameroon also needed to modernize its telecommunications legislation to include CEMAC Electronic Communications Directives and to identify restructuring alternatives for the incumbent operator. Cameroon needed to incorporate e-government and flagship ICT applications.

2.2 The Central African Republic, being landlocked, had neither direct nor indirect access to submarine fiber-optic cables. Fixed teledensity was 0.12 percent and mobile teledensity was 7.99 percent. It was one of the few African countries that remained fully dependent on satellite for international bandwidth. The cost of bandwidth was US$4,000–$5,000 per Mbps per month in 2010, which was very high by regional standards. The equivalent price in East Africa, for example, was approximately US$500/Mbps/month and falling quickly in response to intense competition between submarine fiber-optic cables.[7] Also, there were four mobile operators providing services with broadband available only in the capital city. The focus was on basic needs, including the need to modernize and harmonize the legal, regulatory, and institutional framework for electronic communications services; to define restructuring options for the incumbent operator (SOCATEL), to

increase ICT access in remote areas and to strengthen the capacity of key public stakeholders (Ministère des Postes et des Télécommunications Responsable des Nouvelles Technologies - Ministry of Posts and Telecommunications in charge of New Technologies or MPTNT) and the regulators Agence de Régulation des Télécommunications (Telecommunications Regulatory Agency or ART) and Haut Conseil de la Communication (High Council of Communication or HCC).

2.3 Like the Central African Republic, Chad also lacked access to submarine cables; 100 percent of the international traffic and a good share of its domestic traffic was carried by satellites. In Chad, fixed teledensity was 0.17 percent and a mobile teledensity was 10.26 percent.[8] The major sector issues were the need to accelerate growth in the mobile sector through reduction of call rates and adoption of a universal access policy; to reduce the high cost of international bandwidth that the PPP structure would bring so as to help accelerate the growth of the ICT industry; and to establishing an Internet Exchange Points (IXP) to reduce the cost of international traffic.Objectives, Design, and Relevance

Objectives

2.4 The PDOs, were the same as the CAB Regional Program Objectives.[9] The PDO of CAB APL 1A, stated within the financing agreements[10] for all three countries, was "to contribute to increase the geographical reach and usage of regional broadband network services and reduce their prices".

Components and Costs

2.5 As mentioned earlier, initially the project was intended to include both enabling environment and infrastructure investment activities but the investment part was moved to the next-phase project and eventually got canceled (see Project Context).

2.6 The project comprised the following components, mainly technical assistance activities:

Component 1. Enabling environment (appraisal cost estimate US$19.98 million: US$6.90 million for Cameroon, US$5.68 million for Central African Republic, and US$7.40 million for Chad); actual cost US$18.57 million: US$6.50 million for Cameroon, US$5.19 million for Chad and US$6.88 million for Central African Republic). This component financed technical assistance and training activities as well as equipment associated with providing an enabling environment for developing the ICT sector in the respective countries. Activities included: (i) modernizing and harmonizing the policy, legal, regulatory and institutional framework;(ii) strengthening the capacity of key public stakeholders; and (iii) promoting a competitive environment and restructuring of incumbent operators.

Also included in this component were the structuring and start-up activities required for establishing regional networks interconnected to the existing fiber-optic cable laid along the Chad-Cameroon oil pipeline, including environmental and social management assessment and plans.

Component 2. e-Government and Flagship ICT Applications (appraisal cost estimate US$1.2 million: US$1.20 million for Cameroon; actual cost US$1.16 million: US$1.16 million for Cameroon**.** This activity was intended for Cameroon as the only country with a core broadband network in its capital city. This component aimed at improving government efficiency through supporting the roll-out of selected e-government applications. Activities included: (i) selecting major government services for transition to e-government; (ii) flagship ICT applications; and (iii) establishment of government web portals.

Component 3. Project Management Component (appraisal cost estimate US$5.02 million: US$1.80 million for Cameroon, US$1.62 million for Central African Republic, and US$1.60 million for Chad); actual cost US$4.51 million: US$1.78 for Cameroon, US$1.58 million for Central African Republic and US$1.13 million for Chad. This component financed project management-related activities. Activities financed included: (i) staffing the Project Coordination Unit (PCU); (ii) financing a financial management system; (iii) technical assistance activities; (iv) small works; (v) training; and (vi) financing the operating expenses.

Relevance of Objectives

2.7 The project development objectives were highly relevant to the World Bank strategy for the participating countries at both appraisal and at closure. As mentioned above, before appraisal, the economies of Cameroon, the Central African Republic, and Chad were constrained by the lack of access, limited coverage, and high prices of ICT services. The low coverage and high prices for ICT services were owing to a combination of factors including the countries' isolation and the incomplete market liberalization that allowed the incumbent operators to restrict coverage and keep prices artificially high.

2.8 Theme One of the Country Assistance Strategy (CAS) for Cameroon for the 2010–13 period highlighted the need for increasing Cameroon's competitiveness through, among other things, increased infrastructure investments in the telecommunication sectors. The current Country Partnership Framework (FY2017–21) for Cameroon included improving telecoms by developing a more open and competitive regulatory framework for private telecoms investment. The second axis of the World Bank's Country Partnership Strategy (CPS) for the Central African Republic for the 2009–12 period underscored the need to rehabilitate and develop socioeconomic infrastructure through, among other things, easing the infrastructure bottlenecks that were hindering the development of key sectors, and improving infrastructure for regional economic integration. The Poverty Reduction Strategy Paper (PRSP) for the 2008–15 period for Chad specifically identified the need for Chad to join the integrated fiberoptic communications network. The current Country Partnership Framework (FY2016–20) for Chad mentioned poor communications infrastructure as one important deterrent to private sector investment. Under objective 2.2 (improved environment for private sector investment) the framework specifically mentioned World Bank support to extend and reduce the cost of broadband in the region, together with the International Finance Corporation, which is supporting rural access to telecommunications through direct investments and advisory initiatives.

2.9 The PDO was well aligned with the World Bank's strategy for the project countries and with the World Bank's Regional Integration Assistance Strategy for Africa (RIAS) at

appraisal. This RIAS (discussed by the Board in April 2004) identified ICT as an emerging positive trend in the 21st century for Africa and highlighted the CAB's role for the regional connectivity objective.

2.10 The PDOs were also well aligned with the most recent World Bank strategy documents for the participating countries and other diagnostics reports on ICT.[11] These documents emphasized the importance of the ICT sector for strengthening competitiveness, creating jobs, improving service delivery, and accelerating economic growth in the respective countries.

2.11 In the regional context, the PDO was consistent with the declaration adopted by CEMAC calling for the establishment of a regional CAB under open-access and PPP principles.

2.12 The PDOs are fully aligned with the countries' national ICT sector strategies. In Cameroon, the ICT strategy[12] covering 2010–20 lists a set of objectives to achieve by 2020, which includes: fixed telephony density of 45 percent; mobile telephony density of 65 percent; access of 40,000 villages to modern communication tools; increase of bandwidth to 3,800 Mbps; and a 50-fold increase in direct and indirect digital jobs. In Chad, inclusion of the ICT sector as one of the eight priority objectives in its recent National Development Plan demonstrates commitment to ICT sector priorities.

2.13 The project development objectives are **highly** relevant.

Relevance of Design

2.14 This was a complex project implemented in a challenging environment; two of the three project countries, namely Chad and the Central African Republic, were fragile states. The project design logic—clear and realistic objectives supported by causally linked relevant project activities—was inadequate. The project's intended design during the preparation stage included a focus on leveraging the Chad-Cameroon oil pipeline's fiber optic network to extend broadband into the landlocked countries of the Central African Republic and Chad, and to form a core CAB regional network; the PDO mainly reflected this focus. As mentioned in the Project Context section, it was agreed to move the connectivity infrastructure investment part into the next phase and to include only the technical assistance activities under this project, CAB APL 1A. However, the initial PDO was not revised to reflect the change in activities for the first phase that were largely composed of technical assistance. Although enabling environment technical assistance is a necessary condition, it is not sufficient to fully achieve the PDO.

2.15 The PDO included three objectives: (i) increased geographical reach of broadband services (ii) increased usage of broadband; and (iii) reduced prices. The regional fiber optic investment, if it could be implemented, would contribute to all three objectives. Yet, this activity was not under the scope of CAB 1A, the first-phase project; therefore, the project design would have a limited contribution to achieving the project objectives.

2.16 The project design lacked a thorough political economy assessment and measures to mitigate the risk of low-level national commitment, resulting in the failure to implement

important reform activities in the first phase and cancelation of the 2nd phase. The governments' commitments to the necessary reforms could have been confirmed by signing the Memorandum of Understanding (MoU) with the World Bank. In addition, the project design could have benefited from a communications strategy and a dedicated team to implement the strategy and engage the key stakeholders regarding the key reforms.

2.17 The enabling environment technical assistance under Component One mainly comprised modernizing and harmonizing the policy, legal, regulatory and institutional framework; strengthening the capacity of key public stakeholders; promoting a competitive environment, restructuring of incumbent operators, and technological advancements such as enhanced spectrum management and Internet Exchange Points (IXPs). This would only to a certain extent contribute to the objective of reduced prices and thereby would contribute to the objective, increased usage of broadband services. Component Two activities (implemented in Cameroon only) that aimed at selecting major government services for transition to e-government would also contribute to the second objective, increased usage of broadband services.

2.18 However, the design did not include funds to implement the recommendations of the planned studies, which reduced the impact of technical assistance activities to achieve the objectives.

2.19 The relevance of design is **modest**, because the achievement of project outcomes was not fully causally linked to the specific activities supported by the project, in a manner consistent with the results framework.

Implementation

Key Challenges Facing Implementation

2.20 The following were the most important challenges faced by the project during implementation.

2.21 **Fraudulent Activities in Chad**: During a supervision mission by the Country Financial Management Specialist on August 22, 2013, the team came across ineligible expenses arising from perceived fraudulent activities carried out by the Project Accountant (who was also at the time Acting Project Finance Officer) amounting to CFAF8,705,000 (US$17,794). The project team reported the case of the alleged fraudulent activities to Integrity Vice Presidency (INT) of the World Bank in October 2013. An in-depth review of the use of project funds was conducted to determine whether there were other ineligible and/or fraudulent expenditures. The final figure for ineligible expenses was determined to be CFAF413,189,107 (around US$700,000). Ultimately, seven PCU staff were found to have engaged in fraud and misuse of project funds and were dismissed. After the review concluded, a new fiduciary team was put into place and financial management showed improvement with Interim Financial Reports and audits being submitted on a more regular basis. Nonetheless, financial management in project supervision documents was reported as unsatisfactory overall. As per the World Bank team's response the funds were reimbursed.

2.22 **Security Issues in the Central African Republic**: Because of the outbreak of conflict in the Central African Republic in 2012–14, the World Bank invoked OP 7.30 (Dealings with De Facto Governments) and suspended all project disbursements from March 2013 to April 2014. This suspension affected some contracts and consultancies under CAB 1A, but the PCU remained intact and resumed activity quickly once OP 7.30 was lifted.

2.23 **Resistance of Incumbent Operators in Cameroon and Central African Republic**: Another challenge was the resistance to restructuring by CAMTEL and SOCATEL. The project was restructured after midterm review, by dropping the activities related to restructuring of incumbents.

2.24 **Project restructuring**: Because of the low disbursement rates[13] and difficulties mentioned above, the project was restructured in April 2014. The restructuring included realignment of some indicators, cancelation of some activities (such as the CAMTEL restructuring). However, the restructuring did not include revision of the PDO, and revisions of the outcome indicators were not very helpful (see M&E Section).

2.25 **Safeguards**: The project was assigned environmental assessment category "B" and two safeguards policies were triggered: environmental assessment (OP/BP 4.01), and Involuntary Resettlement (OP/BP 4.12). At appraisal the negative environmental effects were expected to come from terrestrial networks (such as fiber-optic cables laid next to main national roads), rural networks, and landing stations, in the few cases where the latter might be required. The second phase was dropped, but the environmental safeguards were not revised.

2.26 At appraisal, it was anticipated that the project activity associated with the construction of telecommunication and ancillary infrastructure could entail land acquisition and thereby necessitate involuntary resettlement of the affected population

2.27 The project focused on technical assistance and no construction activities were undertaken because these activities were moved to the second phase, which was eventually canceled. Therefore, during implementation no environmental and social safeguards issues arose.

2.28 **Fiduciary Compliance.** In Cameroon, project documents (ISRs and ICR) indicated that financial management was satisfactory overall. Interim Financial Reports as well as internal and external audit reports were submitted on a timely basis and were acceptable, although some of the internal audit recommendations were not implemented. Procurement experienced delays at first because of coordination problems between implementing agencies (CAMTEL, MINPOSTEL, ART, ANTIC, Ministry of Communications,) and weak capacity in some (for example, ANTIC). However, the project team had the PCU hold meetings every two months with the main stakeholders to discuss issues and boost progress, which was helpful. Also, procurement slowed down starting in 2012 with a major institutional change, the creation of the Ministry of Public Procurement. The World Bank assessed this new arrangement and recommended that all projects approved prior to the creation of this new Ministry should follow their original procurement arrangements. The agreement took some time to be finalized and this delayed ongoing procurement processes.

Once it was finalized, however, procurement proceeded smoothly, with the ongoing help of the PCU, and was assessed as satisfactory (as per ISRs) overall.

2.29 In the Central African Republic, financial management was reported in project documents (ISRs and ICR) as satisfactory with only minor shortcomings. All Interim Financial Reports and internal and external audit reports were submitted on a timely basis and all the auditors' recommendations for improving internal controls were implemented. In procurement, there were some initial delays in signing contracts because of political issues, but overall procurement was carried out in a satisfactory and very professional manner by the PCU and with the implementing agency providing effective supervision, including regular use of the Africa Procurement Cycle Tracking System (PROCYS). This is especially notable because of the conflict in the Central African Republic, equipment destruction at the PCU, and temporary suspension of disbursements (OP 7.30) in 2012–14.

2.30 In Chad, there were major weaknesses in both financial management and procurement. Concerning financial management, at the early stages of the project there were problems with the budgeting systems in the PCU and audits were often submitted late. There were several reviews carried out by financial management specialists but most of their recommendations were not implemented. In early 2013, the project team hired a new Project Coordinator for the PCU to strengthen fiduciary oversight. Regarding procurement, despite ongoing assistance offered by the PCU, procurement in Chad was slow prior to the midterm review, with only one technical consultancy having been completed by that time. There was also a near-complete turnover of PCU staff and frequent communications delays between the staff and the World Bank project team. Few of the recommendations for improvements set forth in the aide-memoires were implemented, and most procurement activity was focused on support to the PCU (purchase of vehicles, training, workshops, refurbishing of offices, etc.). National procurement procedures also contributed to the slowness (for example, contracts above $100,000 had to be cleared by the President). Once a new fiduciary team was put in place at the PCU following the forensic analysis, procurement improved, although the filing and archiving system was still inadequate. Procurement was judged as moderately satisfactory overall (as per ICR).

Monitoring and Evaluation

2.31 **Design**: The key outcome indicators for this project were the same as those for the regional program, standard quantitative ones that covered geographic reach, usage, and price of ICT services. The three key outcome indicators at the country level (volume of international communication traffic, volume of national communication traffic and the average price of international communications) were in principle, measurable. The indicators were originally designed to reflect improvements in telecommunications mainly through fiber-optic investments. However, once the project was split into two projects by the World Bank's Regional Operations Committee, the indicators were not revised or updated to reflect the change in the scope of project activities. In addition, outcome indicator targets were set quite low (particularly for price-related indicators). No indicators were designed to monitor and evaluate whether the technical assistance activities were of sound technical quality (no beneficiary assessment included), whether the capacity was built, whether the analysis or knowledge produced was used, or whether the activity had

influence on the intended audience and the downstream effects were achieved or are likely to be achieved, including achieving any intended behavior change.

2.32 Sector ministries and the telecom regulatory authority of the three countries were responsible for data collection. In addition, CEMAC's ICT unit was responsible for data analysis for M&E activities across the three countries. CEMAC would also develop a common M&E system to be shared by all CEMAC members for monitoring Information Technology (IT) activities at the regional level.

2.33 **Implementation**: After the midterm review and project restructuring, some of the key indicators were revised and some were dropped, but this effort did not help to monitor project's outcomes. For example, the outcome indicators "international communications bandwidth per person," "total teledensity," and "average monthly price of wholesale international capacity" were dropped. However, the project team at closure provided data on these dropped indicators as well. Some new indicators were added (number of staff trained in spectrum management, number of MoUs signed), but they were output-oriented. A new indicator was included to measure the impact of the technical assistance activity, that is, designed as an index, but this was a very ambiguous and subjective indicator. Therefore, the technical assistance activities were not monitored adequately.

2.34 Although the new M&E systems were installed and operational in the member states and for the CEMAC Commission as envisaged, a lack of follow-up training and capacity constraints continued; no dedicated M&E specialists were appointed in either the ministries or regulatory agencies. This complicated the task of implementing the M&E systems in the individual countries. The ICT unit of the CEMAC collected the data and performed the M&E once per year from project approval until late 2012. Following this, the conflict in the Central African Republic during 2013 and 2014 resulted in the destruction of computers at the CEMAC ICT Unit and this reportedly undermined the performance of M&E-related activities.

2.35 **Utilization**: The indicators in general were used for monitoring project progress. However, it is not clear whether the data collected were used to inform decision-making and resource allocation. It is important to note that the regulatory agencies in each country carried out various telecom market monitoring overviews (*observatoires*) under the project. These collected many standard telecom/ICT quantitative indicators, a sign of some growing capacity in this area. Cameroon is monitoring some project and project-related indicators on geographic reach, usage, and price of broadband services in its recently adopted National ICT Strategy (Plan Stratégique: Cameroun Numérique 2020).

2.36 Because of the above-mentioned significant shortcomings overall M&E is **modest**.

Achievement of the Objectives

2.37 To assess project efficacy, the PPAR considers three objectives (i) to increase the geographical reach of regional broadband network services (ii) to increase usage of regional broadband network services; and (iii) to reduce their prices.

2.38 To measure the first objective—geographical reach—two indicators are used: “mobile coverage” and “international communications bandwidth (internet, telecoms and data) per person.”

2.39 To measure the second objective—geographic usage—two indicators are used, “internet users per 100 inhabitants” and “total tele-density (active fixed and mobile subscribers per 100 inhabitants).

2.40 To measure the third objective- reduced price, two indicators are used: “average monthly price of wholesale international capacity link” and “retail prices of mobile and internet services.”

Outputs

2.41 The project outputs overlap and contribute to all three objectives and the main outputs are discussed below.

2.42 **Regulatory framework:** As part of implementing the CAB Program, CEMAC and the Economic Community of Central African States (ECCAS) adopted regional Directives on electronic communications to provide a harmonized regulatory framework for electronic communications networks and services within CEMAC member states. A key part of regulatory framework activity was helping the countries to adopt new legal frameworks to transfer these regional directives into national legislation that would also be harmonized at the regional level and thus promote regional integration.

2.43 In Cameroon, a secondary piece of legislation was supported through the project, outlining the rights of telecom subscribers, setting out updated rules for interconnection between operators, defining more specifically the responsibilities of the sector regulators ART and ANTIC, and specifying the regimes for multiservice licenses necessary in the current environment of converged services (Internet, voice, data, video), including the establishment and operations of electronic communications systems such as submarine cable landing stations for access to international connectivity. The IEG mission was informed that specifically, the laws on cybersecurity, cybercrime, electronic commerce and consumer protection were drafted, but not yet enacted.

2.44 In Chad, technical assistance was provided for a new legal framework and this contributed to setting of two new modernized regulatory agencies - The Regulatory Authority for Electronic Communications and Posts (ARCEP) and the Agency for Development of ICT (ADETIC). ARCEP started licenses for third- and fourth-generation wireless mobile communications technology (3G and 4G), and this contributed to increasing competition. However, IEG team found that ADETIC was not performing its functions as planned, because the division of responsibilities between ARCEP and ADETIC was unclear.

2.45 In the Central African Republic, the main telecommunications legislation updated through project technical assistance was submitted to the Council of Ministers for approval at project closing; it was expected that National Assembly would ratify the legislation in 2017, and current status could not be obtained.

2.46 **Equipment and systems**: The project provided equipment for spectrum management and monitoring, and information systems in three countries; it also offset up two Internet Exchange Points (IXPs) in Cameroon, and financed one in Chad. The IEG team found that the IXP in Chad was not yet operational.

2.47 **Strategic positioning of incumbent operators**. Studies on restructuring options for CAMTEL in Cameroon and SOCATEL in the Central African Republic were completed. Implementation did not proceed in Cameroon because of political refusal, and project funds were reallocated. In the Central African Republic, no funds were planned for implementing the study results.

2.48 **Sector studies and e-government in Cameroon**. In Cameroon the studies completed included: a policy note on the regulatory bottlenecks impeding the development of the broadband market; a policy note on the general and specific obligations for the set-up and operation of transport infrastructure for electronic communications; feasibility studies for the use of solar energy for network transmission and for establishing a technology innovation center; and a white paper on operational procedures for submarine cables. In Chad the studies on regulatory tools, regional interconnection, and design of frequency spectrum management regulatory tools were completed. In the Central African Republic, the completed studies were the fiscal study on open access; the study on management and financing mechanisms for setting up the universal service fund; the technical study for implementing digital community centers; and the study on the design of frequency spectrum management regulatory tools (see Appendix B for details).

2.49 In terms of e-government, the government website in Cameroon was completed and the studies on electronic filing system, establishing a hybrid mailing service and reviewing the spectrum management framework were completed. Due to the lack of funding from the project, the hybrid mailing system implementation was financed by the African Development Bank (AfDB) with a follow-up project.

2.50 The project also funded technical assistance for the implementation of a universal service fund in the Central African Republic; a pilot area had been selected by the government for initiating use of the fund and how it would be used in conjunction with awarding licenses to offer services to remote areas. The IEG team was informed that because of the degradation of the security situation the projects were not carried out.

2.51 **Workshops and training**: In Cameroon, capacity building for stakeholders in the telecommunications sector was carried out on: (i) the implementation of the new laws on electronic communications, cybersecurity and cybercrime, electronic transactions, and consumer protection; (ii) communication strategy for the project; and (iii) training for designing and setting up the regulatory tools for spectrum management. Training was provided to the regulator on wholesale markets. In Chad, workshops were held for mobile quality of service and training was provided for procurement. Technical assistance was provided for building the infrastructure for two fiber-optic links extending the national backbone for interconnection with Cameroon and Sudan. Activities included training for the staff of the ministry and SOTEL on the fiber-optic backbone and interconnection, and a survey study on technical specifications used for the Chad-Sudan fiber link. These two

links broke Chad's landlocked status and constituted the first cross-Africa fiber link. The staff of ART were trained on spectrum management and monitoring.

Utilization of Studies

2.52 Utilization of studies was not envisaged under the project. Although all the studies were completed, there were no (or very limited) funds to implement their recommendations, and this also weakened the impact of technical assistance activities on the outcomes. This gap was raised by many stakeholders during the PPAR mission; the agencies had to find other sources of funding to implement the study results, and in some cases the reports were shelved. For example, In Cameroon out of a total of 16 studies, 6 of them were not implemented and 3 were planned to be financed by AfDB (Appendix B). In Chad, out of five studies, three could be implemented (spectrum management regulatory tools, social and environmental impact assessment of fiber optic network from Chad to Sudan; study on regional inter-connection); the remaining two were not implemented (regulatory tools on interconnection/tariffs, networks monitoring and open access; and the IXP feasibility was still not operational during IEG visit).

Attribution

2.53 Not all of the outcomes could be attributed to the project activities. First, activities pertaining to regional ICT investments for improving connectivity, were cancelled in 2012 (APL 1B). As mentioned before, the PDO for the first phase CAB APL 1A was not revised to reflect the activities for the first-phase project that were largely composed of technical assistance. Although the enabling environment technical assistance is a necessary condition, it is not sufficient to fully achieve the PDO. The key investments that would support increased geographical reach, particularly for Chad and the Central African Republic, were mainly financed by others or by the countries themselves without adherence to the three principles envisaged under the CAB program of open access, developing wholesale markets, and promoting public-private partnership (box 2.1).

2.54 Second, the outcomes could also have been influenced by exogenous factors such as the rapid global growth of ICT, whose adoption tends to be faster especially in the urban context, and to the rapid evolution of the sector in general, including the introduction of 3G and 4G mobile broadband technologies, which help to make more broadband accessible and decrease prices.

2.55 Third, parallel and complementary activities financed by other donors played an important role in achieving the objectives as well; for example, although the project included wholesale training to the regulator ART in Cameroon, AfDB also supported regulatory changes on wholesale markets. Therefore, the significant wholesale price reduction in Cameroon cannot be attributed to World Bank technical assistance alone. Again, for Chad, the price reduction is mainly the result of the fiber-optic linkages formed, and of the related investments between Chad-Cameroon and Chad-Sudan. The relatively large bandwidth values for Cameroon mainly reflect its size, its access to international connectivity through its SAT-3 submarine cable landing station and the Nigeria Cameroon Submarine Cable System (NCSCS), and the competition in 3G and 4G mobile services introduced.

Objective 1

2.56 The objective, to contribute to increase the geographical reach of regional broadband network services, is **modestly** achieved.

Outcomes

2.57 The project assistance helped to sign interconnection regimes between the countries (see box 2.1 for details). It may be argued that interconnection agreements could have contributed to the increase in geographical reach to a certain extent. However, because the fiber-optic investment envisaged originally under the project did not materialize, it is not possible to fully attribute the results to the project interventions (See Attribution Section).

Box 2.1. Situation on International Connectivity

After the Memorandum of Understanding signed between the Central African Republic and Chad in May 2012, interconnection to Chad is expected to follow in the near term through financing provided by the Chinese company Huawei. This connection would give the Central African Republic access through Chad's network to submarine cables and international connectivity on both African coasts. In 2012, Chad signed an interconnection agreement with Cameroon and built 1,500 km of fiber-optic infrastructure linking N'Djamena to the Cameroon coast and giving the country access for the first time to international connectivity through the SAT-3 submarine cable. Its second link between N'Djamena and the Sudanese town to El-Geneina (from there connecting Chad with the Eastern African Submarine Cable System (EASSY) landing station in Port Sudan), a distance of 1,500 km, was eventually implemented in 2014 and 2015 by the Chinese. In Cameroon the creation of the Nigeria Cameroon Submarine Cable System (NCSCS) and extensions of the national backbone were financed by a Chinese company, and interconnection links were financed by AfDB.

Source: ICR and IEG discussions with project stakeholders

2.58 In terms of geographic reach outcome indicators, the following results were reported (see table 2.1 for details):

- **Cameroon**
    - At project closure, i.e. end of 2015, 92.5 percent of the population had mobile coverage compared to 35 percent at the baseline. This exceeded the original target of 70 percent. This was about the same as of end of 2016 (the most current figures).
    - International communications bandwidth (internet, telecoms, and data) per person (bits) increased from 10.95 person/bits at the beginning of project to 30 at project closing (less than the target of 80).
- **Central African Republic**

- At project closure, that is, at the end of 2015, 59 percent of the population had mobile coverage compared to 19.3 percent at the baseline. This was about the same as of the end of 2016.

- International communications bandwidth (internet, telecoms, and data) per person (bits) increased from 0.35 person/bits at the beginning of project to 2.38 at project closing (less than the target of 3). International Telecommunications Union (ITU) data in 2016 showed that this figure was 1.8.

- **Chad**

  - 83 percent of the population had mobile coverage compared to 24 percent at the baseline. This exceeded the original target of 50 Percent, and increased to 86 percent as of the end of 2016.

  - International communications bandwidth (internet, telecoms, and data) per person (bits) increased from 1.58 person/bits at the beginning of project to 9.06 at project closing (less than the target of 50). ITU data in 2016 showed that this figure was 3.6.

Table 2.1. Project Indicators

	Cameroon			CAR			Chad		
Indicators	**Baseline-2009**	**Closing-2015**	**2016**	**Baseline-2009**	**Closing-2015**	**2016**	**Baseline-2009**	**Closing-2015**	**2016**
International Communications bandwidth	10.95	30	na	0.37	2.38	1.8	8.58	9.06	3.6
Internet users per 100 inhabitants*	3.4	20.7	25	0.3	4.6	4	1.2	7.1	5
Total teledensity (active fixed and mobile subscribers per 100 inhabitants)*	28.1	91.7	84.34	8	36	27.2	24	41	43.2
Coverage of mobile network (percentage of population)-	35	92.5	92.5	19	59	58	24	83	86
Average monthly price of wholesale international	6000	920	na	7000	3200	na	7000	108.8	na
Retail prices of Internet services (per Mbit/s per	660	200	na	1700	1000	na	2120	1080	na
Average cost of mobile call (1 minute local peak, in US$)	0.306	0.04	na	0.57	0.4	0.10	1.05	0.23	0.12
Average monthly price of Internet access (256 kbps in	165	50	na	425	250	465.29*	530	270	404.11*

Source: For Baseline and closing: Implementation, Completion, and Results Report, and for 2016 International Telecommunications Union data. (* ITU data)

Objective 2

- The objective**,** to contribute to increase the usage of regional broadband network services, is **modestly** achieved**.**

Outcome

2.59 There has been increase in usage, but as mentioned before, it is not possible to attribute the results to the project (see Attribution Section). In addition, the usage of ICT services is still low in all three countries but particularly Chad and the Central African Republic. As can be seen from the project indicators (table 2.1), internet users have increased to a certain extent in Cameroon but in Chad and the Central African Republic the market is still extremely small (though targets have been exceeded). ICT markets are dominated by inefficient incumbent operators with adverse effects on quality, price, and usage of ICT services. The mobile telephony markets were relatively mature, but high retail prices are constraining their growth. In addition, one key factor in low internet usage is the very high prices, particularly in the Central African Republic and Chad (see objective 3 below). ICT Development Index figures show that Chad ranks 174th among 175 countries and Cameroon ranks 148th in 2016 (the Central African Republic is not included on this index).

2.60 In terms of usage outcome indicators, the following results were reported (see table 2.1 for details):

- **Cameroon**
    - Internet users per 100 inhabitants increased from 3.4 people at the beginning of project to 20.7 at project closing. The target of 4.5 was exceeded.
    - Total teledensity (active fixed and mobile subscribers per 100 inhabitants) increased from 28.1 percent at the beginning of project to 91.7 percent at project closing, less than the target of 50 percent. In 2016 the ITU figure was 84 percent.
- **Central African Republic**
    - Internet users per 100 inhabitants increased from 0.3 percent at the beginning of the project to 4.6 percent at project closing, exceeding the 1.6 percent.
    - Total teledensity (active fixed and mobile subscribers per 100 inhabitants) increased from 8 percent at the beginning of the project to 36 percent at project closing, exceeding the target of 27 percent. This was 27 in 2016 according to ITU data.
- **Chad**
    - Internet users per 100 inhabitants increased from 0.8 percent at the beginning of project to 7.1 percent at project closing, the target of 1.4 percent was exceeded.
    - Total teledensity (active fixed and mobile subscribers per 100 inhabitants) increased from 24 percent at the beginning of project to 41 percent at project closing, less than the target of 50 percent. This was 43 percent in 2016 according to ITU data.

Objective 3

The objective, to contribute to reduce prices, is **modestly** achieved.

Outcome

2.61 The project included technical assistance to strengthen the regulatory capacity, and also assisted in awarding of additional licenses to private operators and these, to some extent, would contribute to reduction in prices. For example, in Cameroon one and in Chad two new mobile operators were awarded licenses. In Chad, shortly after the new regulator, ARCEP, was established in 2014 through legislation resulting from CAB APL 1A Project-financed technical assistance, it awarded 3G and 4G licenses to the two main mobile operators, Airtel and Tigo, helping to introduce more advanced mobile broadband to the country and to maintain competition in the rollout of those services, starting in N'Djamena.

2.62 Nevertheless, internet prices are still very high and not affordable. According to the ITU's global ICT report, the Central African Republic had the highest fixed broadband price per GNI in the world among 182 countries in 2015 (with 1,832) followed by Chad (613); in comparison, Kuwait has 0.26 and China 0.27.[14] Mobile broadband figures measured as "500 MB / GNI in percentage" are as follows: -for Chad 11.5 percent, for Cameroon 3.1 percent, Africa average 9.3 percent and the World average is 3.7 percent. While the mobile broadband prices are more affordable compared to fixed internet prices, they are still expensive particularly for Chad.

2.63 The reasons for high prices are the following: First, the ICT markets in these countries are far from a real competitive environment, and open-access principles are not fully implemented, with adverse effects on price.

2.64 For example, in Cameroon, CAMTEL still holds a dominant/monopoly position in access to international networks (landing stations) and in the operation of the national backbone. IEG was informed that legal agreements with mobile operators on building national networks are not enforced. This lack of enforcement translates into poor quality of services to CAMTEL and other Internet Service Providers that rely on this national access, as well as high prices. The ICR argues that in Cameroon, the award of a license to a third operator Viettel (which later became Nextel), in addition to the earlier operators Orange and MTN, was due to the project technical assistance; however, IEG was informed that the recommendations of the project technical assistance were not followed and that in fact, government methods and formulae were employed to finalize this license. IEG was also informed that Vodafone was interested in entering the mobile market (it currently operates on internet) in Cameroon but later on decided not to enter partly because of the dominance of CAMTEL.

2.65 Second, the restructuring of incumbent operators was not achieved under the project. This also has negative consequences on quality and price of the services. In Cameroon a technical assistance on restructuring alternatives was prepared but could not be implemented for political reasons, and the resources were allocated to other activities. In the Central African Republic, the project developed restructuring options for SOCATEL, but no funds were included to implement this activity. In Chad, the project did not include

restructuring of SOTEL and during the PPAR mission IEG was informed that its activities were put on hold by the government because of the deteriorating financial situation.

2.66 For price outcome indicators, the following results were reported (see table 2.1):

- **Cameroon:**
    - Average monthly price of wholesale international capacity link from Yaoundé (Cameroon) to European Hub (E1) dropped from US$6,000 at the baseline to US$920 at project closure. This exceeded the original target of US$1,200.
    - Retail prices of Internet Services (Mbps per month) dropped to US$200 as per the original target, compared to US$660 at the baseline.
- **Central African Republic**:
    - Average monthly price of wholesale international capacity link from Bangui (Central African Republic) to European Hub (E1) dropped from US$7,000 at the baseline to US$3,200 at project closure. This was short of the target of US$2,500.
    - Retail prices of Internet Services (Mbps per month) dropped from US$1,700 at the baseline to US$1,000 at project closure. However, this was well short of the target of US$400.
- **Chad.**
    - Average monthly price of wholesale international capacity link from N'Djamena (Chad) to European Hub (E1) dropped from US$7,000 at the baseline to US$108.76 at project closure, compared to the target of US$2,000.
    - Retail prices of Internet Services (Mbps per month) dropped from US$2,120 at the baseline to US$1,080 at project closure. This was short of the target of US$320.

Efficiency

2.67 At appraisal, an economic and financial analysis for each country was carried out based on the assumption that investment in fiber-optic infrastructure would be supported through a PPP in the second phase. The project eventually financed mainly technical assistance activities but did not have a formal cost-benefit analysis because of the difficulties of measuring benefits.

2.68 All planned activities (after restructuring) were completed at project closure with a disbursement of 96 percent as of March 14, 2016. However, the recommendations of some of the studies financed by the project were not implemented (see Appendix B). As mentioned in the previous section, this clearly reduces the benefits ensuing of the studies.

2.69 **Administrative and Operational Costs**. There were no cost and time overruns. The funds resulting from cancelled activities were used to finance activities with regional implications as requested by the governments. There were no time overruns. Despite the outbreak of conflict in the Central African Republic in 2012–14, which resulted in suspension of project disbursements from March 2013 to April 2014, all planned activities were completed by the scheduled project closing date.

2.70 However, there were two administrative operational efficiency issues: (i) overhead costs for the individual PCUs were high (between 20 percent and 25 percent) compared to other similar projects such as CAB Congo and West Africa Regional Connectivity Program (WARCIP) projects (between 8 percent and 12 percent); (ii) significant fiduciary issues were encountered in Chad and there were ineligible expenses with a magnitude of US$700,000.

2.71 Given the operational efficiency issues, the efficiency of the project on balance is **modest**.

Ratings

OUTCOME

2.72 The project outcome of this CAB APL 1A is **unsatisfactory**, based on the **high** relevance of objectives and the **modest** relevance of design; the **modest** achievement of all three development objectives: to increase geographical reach and usage of regional broadband network services, and to reduce their prices; and because of the project's **modest** efficiency.

2.73 The relevance of objectives is rated **high** because the project development objective was fully relevant to the priority support areas identified under the Country Assistance / Partnership Strategies for Chad, the Central African Republic, and Cameroon, and the regional and governments' goals/strategies. The relevance of project design is **modest**. The achievement of the original unrevised project objectives is rated **modest** because the technical assistance activities in support of an enabling environment under this project are not sufficient on their own to fully achieve the PDO of increased geographical reach and usage of broadband network and reducing its prices. In addition, the achievements shown under the outcome indicators cannot be fully attributed to the project activities because there were other exogenous factors at play, such as the rapid global growth of ICT, whose adoption tends to be faster, especially in the urban context and because of the rapid evolution of the sector in general. Furthermore, key infrastructure investments on interconnectivity that would significantly contribute to these outcomes were financed by other donors or countries themselves, while partially adhering to the CAB Program's intended general principles of open access, developing wholesale markets, and promoting public-private partnership. The efficiency of the project is rated **modest** because of administrative and operational inefficiencies.

RISK TO DEVELOPMENT OUTCOME

2.74 The risks to development outcome are **substantial** because of institutional risk and political commitment risks.

2.75 **Institutional Risk**: There has been some progress on the regulatory framework through enactment of telecommunications law and secondary regulation. However, the regulatory agencies are still weak in all three countries and need further support.

2.76 **Political Risk**: In addition, the incumbent operators need to be restructured, which was attempted by the project but not successful. The lack of political will may inhibit the restructuring, which would halt the progress of the ICT sectors, particularly in Cameroon. Thus, the remaining key sector reforms in all three countries increases the risk to development outcome to substantial.

BANK PERFORMANCE

Quality at Entry

2.77 The regional program was based on lessons from regional operations in Africa such as the Regional Communications Infrastructure Program (RCIP) operations in Kenya, Burundi, and Madagascar, and the Southern Africa Power Market Program. Lessons from these projects that were incorporated included emphasizing the need for a proper enabling environment for development of the ICT sector in each country and mobilizing resources to strengthen the implementation capacity prior to approval, given that weak implementation capacity across participating countries had been identified in the RCIP project as a key constraint to accelerating the implementation of the project. The World Bank team brought together different partners—AfDB, the CEMAC, and the African Union, who made financial resources available through the Project Preparation Facility for helping the countries to be ready to move quickly on implementation after project effectiveness.

2.78 Despite these positive aspects to project preparation there were significant shortcomings in the project's quality at entry. IEG concurs with the ICR that although the preparation took two years, but it seemed more time was needed to get the political commitment about the reforms and improved policies in the sector. The original design was ambitious, covering three countries each with its own sector issues and capacities, implementing agencies, and views on the creation of a regional PPP. The original proposed Central African Backbone (CAB 1) project was split into two phases, with the first phase (CAB 1A) focusing on the technical assistance activities for the respective countries and the second phase (CAB 1B) on the investments in regional ICT connectivity infrastructure through PPP arrangements. The reason for this change was, in part, so that the first phase could be included in the FY2009 allocation of IDA-15 commitments, rather than allowing for more time to prepare the CAB 1 project. This rush, along with the insistence on keeping the challenge of the regional PPP structure in CAB1B for Board approval shortly after CAB 1A, contributed to uncertainty at the Regional Operations Committee meeting of April 2009, when it was not even known at first whether Chad would participate. In short, the project team and the countries were not fully ready for CAB 1 to move forward. The decision to split CAB 1 into two phases also weakened perception of the World Bank's

seriousness about the project in the eyes of the participating countries because of the subsequent delay in infrastructure investment. This rush made it difficult to get commitment from the participating countries to carry out the more difficult reforms (establishment of regional PPP, restructuring of incumbent operators).

2.79 The project did not consider the lack of political commitment to proceed with the project's technical assistance solutions, the particularly strong political power of incumbent operators, and their unwillingness to open up the sector for competition, as key risks to the reforms. Therefore, no measures were designed to mitigate that risk through project design.

2.80 The design of the project did not include funds for the implementation of recommendations of the studies financed under the project. As mentioned earlier, this reduced the impact of the project.

2.81 There were shortcomings in monitoring and evaluation (M&E) design. It is not clear whether there was a thorough assessment of the results framework at design, given that the PDO and the outcome indicators were focused on activities associated with investments in the regional ICT infrastructure and hence not appropriate for monitoring the technical assistance activities eventually financed by the project. Appropriate arrangements were, however, made for compliance with safeguards.

2.82 The World Bank's quality at entry is rated **moderately unsatisfactory**.

Quality of Supervision

2.83 The Bank Team had to operate in a challenging environment (two of the three countries, namely Chad and Cameroon were fragile states). Twelve Implementation Supervision and Results Reports (ISRs) were filed over a six-year period. The task team leader was based in Yaoundé (Cameroon) and the proximity to Chad and the Central African Republic aided in communication with the counterpart agencies in the project countries, and also contributed to resolving issues and providing support for procurement throughout the life of the project. World Bank supervision missions conducted in the field on a regular basis helped in constant monitoring of activities during project. The supervision team also addressed issues faced by the project, such as governance issues in Chad and security threats in the Central African Republic; this cooperation, in conjunction with extensive work with the national project teams, contributed to ensuring that activities were completed in a timely fashion. Furthermore, constant dialogue, numerous technical discussions proactive support by the Bank team to the client during implementation, reportedly led to the countries' requesting follow up operations from the Bank.

2.84 One important weakness was that the supervision team did not appropriately revise the results framework and indicators to reflect the project's technical assistance activities during implementation. A "level one" restructuring, rather than "level two" was necessary to revise the PDO and relevant outcome indicators to track quality and utilization of studies and assess behavior change as a result of the activities. However, the supervision team dropped activities that were no longer feasible and used the funds saved to set up activities that the governments identified as priorities.

2.85 The quality of supervision is rated **moderately satisfactory**.

2.86 The quality at entry was rated moderately unsatisfactory and quality of supervision was rated moderately satisfactory, making the overall World Bank performance rating **moderately unsatisfactory.**

BORROWER PERFORMANCE

Government performance.

2.87 The three participating countries were committed to project activities at the beginning. However, The Government of Chad provided inconsistent commitment to the project in the early stages, but after the midterm review the National Assembly passed nine new laws related to electronic communications, based on technical assistance provided by the project. The Central African Republic remained largely supportive throughout the project, and despite the security difficulties and their aftermath between 2012 and 2014, telecom regulations were completed. Cameroon was supportive in general, but important reforms related to restructuring of the incumbent operator were not pursued. The Central African Republic was committed but enactment of the regulations was delayed because of the security issues between 2012 and 2014 and their aftermath.

2.88 Regarding counterpart financing, the appraisal estimate for the contribution from Cameroon was US$0.53 million. Cameroon's contribution at project closure was 4 percent more than planned at US$0.55 million. No contributions by way of counterpart funding were envisaged from the Central African Republic and Chad.

2.89 The government performance is rated **moderately unsatisfactory**.

Implementing agencies performance

2.90 For each country the sector ministry was responsible for the overall coordination, implementation, and supervision of the project. For project activities involving different agencies, the sector Ministry, through its PCU, consulted with and delegated to the relevant agencies and ministries. Implementing agencies in each country showed different levels of performance.

2.91 In Cameroon the implementing agencies were at first slow to take ownership of the various parts of the project they were responsible for implementing. This was compounded by inconsistent support from the Minister of Post and Telecommunications regarding some of the reforms to be carried out under the project, particularly the restructuring of CAMTEL. The PCU was proactive in becoming involved early on to help alleviate procurement delays. Its handling of procurement and financial management was good, aided by its regular use of the Africa Procurement Cycle Tracking System.

2.92 In the Central African Republic there were some challenges at the beginning to the performance of the main government implementing agency because of a large turnover of ministers. However, the PCU carried out all its functions in a highly professional manner throughout the project, particularly notable given the conflict in the country in 2012–14. It worked very closely with the government to ensure efficient procurement, financial management, and project implementation. Also, the PCU’s competence in executing the

project is proven through its provision of training to other World Bank project PCUs in the country.

2.93 In Chad, overall leadership by the main government implementing agency was weak. Both the ministry and the other implementing agencies had difficulties following the World Bank's rules and drafting terms of reference for more complex assignments. The government's cumbersome national administrative and procurement procedures also did not aid swift implementation. The PCU had weaknesses in financial management and procurement during the first half of the project; the problem with ineligible expenses charged to the project has been noted earlier. The installation of a new fiduciary team following the forensic analysis of financial management helped greatly in accelerating procurement and remedying financial management.

2.94 CEMAC was involved in project design and actively participated in negotiations, and its role was critical for the formulation of the project. Then CEMAC had a very limited role during implementation (it was only responsible for M&E) but did not carry out this function adequately (see M&E section). Although in principle CEMAC was responsible for regional ICT development, it did not have sufficient capacity and resources to perform this function well.

2.95 The performance of the implementing agency in the Central African Republic was moderately satisfactory. However, the overall performance of implementing agencies is rated **moderately unsatisfactory**.

2.96 Because both the government performance and implementing agency performance were moderately unsatisfactory, overall Borrower performance is rated **moderately unsatisfactory**.

3. Central Africa Backbone APL 2 (São Tomé and Príncipe)

Country context

3.1 São Tomé and Príncipe, with a population of about 204,000[15] is one of the smallest economies in Africa. An archipelago comprising of two main islands and four islets, São Tomé and Príncipe is located in the Gulf of Guinea. It is a lower-middle income country, with a GNI per capita of US$1,730.[16] About 62 percent of the population is poor. The gross domestic product (GDP) was US$389 million in 2016 and the real GDP growth was about 4 percent during the period 2014 to 2017.[17] São Tomé and Príncipe ranks 169th out of 189 economies in the 2018 Doing Business Report.

Key sector issues

3.2 São Tomé and Príncipe was among a handful of countries in the West Africa Region which was not connected to the global network of broadband optical fiber infrastructure. Small states in the region were often bypassed by submarine cable consortia, because their markets were not attractive enough for investment.

3.3 In 2010, São Tomé and Príncipe was dependent on costly satellite communications technology while countries connected to submarine cables could access international capacity at much lower prices. For example, in East Africa the price reduced from US$3,750 Mbps/month before arrival of the cables in 2007 to $400 Mbps/month in 2010[18]. However, at appraisal, São Tomé and Príncipe had one of the highest satellite prices in the world (with average satellite prices ranging between US$4,000 to US$5,000 Mbps/month[19]). High connectivity prices translated into high prices for international calls and internet cost.

3.4 Moreover, the country had low coverage of ICT services. Although mobile coverage reached 70 percent of the population, it covered less than 30 percent of the territory.[20] Fixed line density was just about 5 percent, mobile telephone penetration stood at about 62percent, and internet penetration was just about 0.7 percent.

3.5 The Government of São Tomé and Príncipe had attempted to introduce competition in the mobile telecommunications market in 2007, but had not been successful because operators were not interested. Therefore, at the appraisal stage, it was important for the country to open the mobile telecommunication sector to competition and improve the provision of international telecommunication bandwidth capacity through alternative means such as connectivity to submarine cable.

3.6 At the appraisal, the viable option, as compared to the other options, for providing international connectivity to countries in Western and Central Africa was by connecting to the ACE submarine cable. Other submarine cables existed at the time (SAT3, SAFE, WACS), but with closed consortia or monopolistic models, none of them provided connection to São Tomé and Príncipe.[21] The ACE project, connecting South Africa to Europe, could potentially provide connectivity to 23 countries along the route. The World Bank conducted a comparative analysis of various connectivity options and the costs associated with those options. The comparative analysis indicated that in the absence of alternative submarine cable projects or satellite projects in the near future, providing international connectivity through the ACE project was the most attractive option for countries in Western and Central Africa.

Objectives, Design, and Relevance

Objectives

3.7 The PDO was to contribute to increasing the geographical reach and usage of regional broadband network services and to reduce their prices in the Recipient's territory.

Components and Costs

3.8 There were three components:

- Component 1: Enabling Environment (estimated cost at appraisal was US$1.15 million, actual cost was US$1.42 million). This component was intended to create an enabling environment for the development of the ICT sector in São Tomé and Príncipe. Activities included technical assistance and capacity building for: (i) legal and

regulatory reform, (ii) developing PPP arrangements and launching a second mobile telecommunications operator to provide fixed and mobile services, and (iii) environmental studies and M&E support.

- Component 2: Connectivity (estimated cost at appraisal was US$13.25 million, actual cost was US$13.10 million). This component planned to finance the cost of São Tomé and Príncipe's participation in the ACE Optical Fiber Submarine Cable on an "open-access basis" through PPP arrangements. The ACE was an optical fiber submarine cable system for connecting South Africa to Europe, either directly for coastal countries or indirectly through terrestrial links. The "open-access basis" meant that all ACE consortium members would have unfettered access to ICT infrastructure or services under similar terms and conditions. The other activities in this component included leveraging private sector investment in the telecommunications sector and associated investments, such as setting up of IXPs.
- Component 3: Project Management (appraisal estimate was US$0.5 million, actual cost was US$0.55 million). This component supported project management in the areas of human resource management, financial and procurement management, M&E, internal and external audits, communications expertise, and financing costs associated with operating expenses and equipment.

Relevance of Objectives

3.9 At appraisal and currently, the PDOs were highly relevant to the World Bank's strategy for São Tomé and Príncipe, and with the government's goal of accessing regional and global markets to unlock additional growth opportunities.

3.10 The project objectives were consistent with the World Bank's Country Assistance Strategy for São Tomé and Príncipe for the period FY2006–09, which was valid at the time of approval. The government was preparing the way for the privatization of the telecom sector and ending the telecom monopoly; the World Bank's strategy was intended to support the government in facilitating the telecom sector reform. The World Bank's Second National Poverty Reduction Strategy for São Tomé and Príncipe for the period FY2012–16 identified the need to provide the entire population with ICT services and reduce the high costs associated with them. The specific telecom objectives included: (i) development of universal services; (ii) providing a legal and regulatory framework to ensure the promotion of investment in the sector; and (iii) development of new services provided by the sector. The project objectives continued to be relevant to the first theme of the World Bank's current Country Partnership Strategy (FY2014–18) for São Tomé and Príncipe which aimed at "supporting macroeconomic stability and national competitiveness" through improved regional broadband connectivity. The strategy would assist in harnessing the potential of ICT to create jobs and ICT-based services.

3.11 The objectives were consistent with the government's priorities for the ICT sector: assessing global and regional markets, improving communication capacity and the affordability of international communication so as to reduce São Tomé and Príncipe's insularity from global markets. São Tomé and Príncipe does not have an ICT strategy. One of the project activities was to support the government in preparation of ICT strategy.

3.12 The project objectives were consistent with the first pillar of the World Bank's 2008 Regional Integration Assistance Strategy for Sub-Saharan Africa. This pillar stressed the development of regional infrastructure to build stronger and better-connected infrastructure platforms to help unlock economies of scale and sharpen competitiveness in Africa. The World Bank's support focused on improving telecommunication connectivity. According to the strategy, regional collaboration in telecommunications and ICT development is indispensable to strengthen regional interconnectivity, and drives down costs.

3.13 The relevance of objectives is rated **high**.

Relevance of Design

3.14 At appraisal, São Tomé and Príncipe had no other opportunities available to connect to another submarine cable for many years to come. The World Bank performed detailed due diligence on this possible investment upfront, comparing it with other options that might potentially become available for accessing high-speed international connectivity for São Tomé and Príncipe, and confirmed that ACE was the most favorable option.

3.15 The project design logic—clear and realistic objectives supported by causally linked project activities—was in general sound. The project design was comprehensive and can therefore be expected to fully deliver the outcomes. The financing of São Tomé and Príncipe's contribution to the ACE submarine cable on an "open-access basis" through a PPP arrangement would provide the much-needed connectivity to broadband internet and mobile services and would contribute to the project objectives of increasing geographical coverage and reducing prices, thereby leading to increased usage.

3.16 The project's technical assistance supported the creation of the enabling environment for the development of the ICT sector in São Tomé and Príncipe. The specific activities relating to strengthening the legal and regulatory capacity, developing PPP arrangements in the sector, and the launch of a second mobile telecommunications operator to increase competition can be expected to contribute to the project objectives of reduction in prices, thereby leading to increased usage.

3.17 The project activities can be expected to contribute to the regional program objective of improving telecommunications connectivity for the Africa region.

3.18 Taking all these factors into account, the relevance of design is rated **high**.

Implementation

3.19 **Setting up of STP-Cabo SARL (Sociedade Anónima de Responsabilidade Limitada), a Special Purpose Vehicle (SPV) company**. The creation of the SPV was agreed during negotiations between the government of São Tomé and Príncipe, the incumbent Companhia São Tomense de Telecomunicações (CST), and Portugal Telecom in July 2010. SPV was the PPP model adopted to secure funding from existing and future private operators and for channeling the different parties' contributions into the consortium. Structuring the SPV under an "open-access" principle ensured that future operators in São Tomé and Príncipe would be able to access cable capacity with similar conditions. The

creation of the SPV was an effectiveness condition for the IDA grant, and the SPV was duly created before the project became effective. A full-fledged technical assistance was provided to the government along with a second round of intensive negotiations with the private sector partner (CST/Portugal Telecom) that ended with: (i) incorporation of STP-Cabo SARL; (ii) full substitution of CST by STP-Cabo SARL.

3.20 **ACE Submarine Cable**. The ACE cable was initiated by the French Telecommunication Corporation "Orange" and administered by a consortium of 17 operators linking Europe to the western and southern coasts of Africa with advanced high-speed broadband fiber optic technology. Its roll-out was divided in two phases—Phase 1 comprised three segments of service (France-Senegal, Senegal-Côte d´Ivoire, and Côte d´Ivoire-São Tomé and Príncipe) connecting 16 countries. Phase 2 planned to extend the cable from São Tomé and Príncipe to South Africa (to be named segment 4). The technical execution and project management for the ACE cable were left to the ACE private sector consortium and its supplier, Alcatel.

3.21 The government of São Tomé and Príncipe participated in the consortium meetings. At the meetings, São Tomé and Príncipe was initially represented by CST and then by STP-Cabo and the regulator AGER. IEG was informed that at specific meetings, other representatives participated. For example, the Minister of Foreign Affairs was present for the signing of the construction and maintenance agreement.

3.22 The Government of São Tomé and Príncipe paid a membership fee to participate in the consortium: overall, the government contributed US$25 million out of the total US$700 million ACE cable investment; US$13.1 million of this contribution (52.4 percent) was financed by the government through the project, and the remainder was contributed by Portugal Telecom and CST as the private sector partners. By November 2012, the project had disbursed 93 percent out of the total amount of US$14.9 million—with all payments to the ACE consortium completed.

3.23 The ACE cable effectively arrived in São Tomé and Príncipe in November 2011, the landing station was inaugurated in October 2012, and the cable was commercially launched in February 2013 after a period of tests throughout the 16 countries connected by ACE.

3.24 **Awarding of the second license to UNITEL.** Although the process for the second license was initiated shortly after effectiveness, it took some time to materialize. The government sold its 24.5 percent share in STP-Cabo, thereby fully divesting, and kept only a golden share which gives it the power to veto any changes to the statutes, particularly the principle of open access to cable capacity. There were delays by the government in the approval of the bidding documents for tendering of the license. The government finally awarded a second telecommunications global license to UNITEL International Holdings in May 2013 and the commercial launch took place in July 2014. The new shareholder structure is 74.5 percent for the CST, and 25 percent for UNITEL.

3.25 **Safeguards**. The project was assigned environmental category "B" because the connectivity to the ACE cable was expected to have minor adverse environmental impact. The PAD noted that for the deep-sea submarine cable and all lateral connections to shore, a

detailed Cable Route Survey was conducted by the Cable Suppliers to avoid laying the cable on sensitive or high-risk benthic features such as deep-water coral gardens and rocky or coral reefs. In São Tomé and Príncipe, no lateral connection was expected because the main cable would be brought to shore. As the cable gets closer to the shores in water depths shallower than 1,500m, the cable's diameter may increase to about 40–50 mm because of the need to add protective wire covering. Therefore, for the cable and associated equipment onshore, there would be some temporary, low to moderate environmental impacts including localized impacts to nearshore marine life and local fishermen's access.

3.26 Two safeguards policies: Environmental Assessment (OP/BP 4.01) and Involuntary Resettlement (OP/BP 4.12) were triggered. An Environmental and Social Management Framework which was consistent with the national laws and any applicable treaty concerning international waters was prepared at appraisal. The draft ESMF indicated that the proposed landing sites had very limited marine activities and were not likely to experience significant disturbances. An Environmental and Social Management Plan was published on September 2011.

3.27 Throughout implementation, no environmental issues were reported and the environmental safeguards was rated satisfactory in the ISRs.

3.28 Although involuntary resettlement or displacement from land-based livelihoods was not expected, the involuntary resettlement safeguard was triggered in case the project required land acquisition and resettlement. The Resettlement Policy Framework (RPF) was prepared and disclosed to the public on November 23, 2010. Based on the RPF, the PAD noted that a Resettlement Action Plan or an Abbreviated Resettlement Action Plan would be prepared, depending on the cable station site.

3.29 CST selected one of its existing buildings for the cable station at São Gabriel which needed to be rehabilitated and upgraded. However, the associated parking and fuel infrastructure alongside the building required some land, which was being used for urban farming. This land was owned by CST and did not belong to the farmers. ARAP identified six individuals who would lose access to the land and thereby to their source of income.

3.30 During project implementation, seven project-affected persons were compensated. CST was responsible for the payment of all compensation and US$13,005 was paid in accordance with the Abbreviated Resettlement Action Plan. This included US$4,806 for the direct loss of harvest, US$1,772 for income support, and US$6,427 for restoration of income. No issues were reported relating to the involuntary resettlement safeguards, and the ISRs reported involuntary resettlement performance as satisfactory throughout the project cycle.

3.31 **Financial Management**: Agência Fiduciária de Administração de Projecto (AFAP) was the project implementing agency and oversaw financial management and procurement. In 2012, the World Bank conducted a review of the financial management arrangements at AFAP to verify their continuing adequacy to reliability and integrity of the financial reporting, effectiveness, and efficiency of project operations as well as compliance with covenants on financial management. The review found that the project's financial management was adequate, with a Financial Manager and an experienced accountant

overseeing all financial aspects of the project. Both the Financial Manager and the account have received additional software training in Cameroon and France. Some concerns were raised: although accounting transactions were processed through a combined mechanism of Excel spreadsheets and the TomPro software, the review found that the TomPro software had transactions updated only through March 2012. This situation was corrected on October 1, 2012 following the recommendations of the review.

3.32 The financial management performance was rated satisfactory in the ISRs throughout project implementation. The audit reports were submitted in a timely fashion and were acceptable to the World Bank. All project audits were external and unqualified, except for the 2012 audit, which was qualified. However, the issue related to the qualification was minor and was resolved by the time the final audit report was delivered. During the second half of the project implementation, the implementing agency (AFAP) started using e-Disbursements which resulted in electronic submission of withdrawal applications and contributed to savings in mail and transaction costs.

3.33 **Procurement**: At appraisal, the implementing agency had a qualified Procurement Officer and a Project Coordinator, who were experienced in the World Bank's procurement rules because they were managing two other World Bank–funded projects. The World Bank provided two staff members from AFAP a one-week training in World Bank procurement guidelines.

3.34 The payment to the ACE consortium, which accounted for 88 percent of project funds, was not subject to World Bank procurement guidelines because it went toward non-procurable activity. For the remaining 12 percent of project funds, no procurement issues were reported and the procurement performance was rated satisfactory in the ISRs throughout project implementation.

Monitoring and Evaluation

3.35 **Design**: The key outcome indicators for this project were the same as for the regional program. The results framework is clear, and the outcome indicators were measurable and appropriate for tracking the project's achievements. The indicators "mobile coverage" and "international internet bandwidth" measure the first objective, "geographical reach." The indicators "internet users per 100 inhabitants" and "total teledensity (active fixed and mobile subscribers per 100 inhabitants) measure the second objective, "geographic usage." The indicator "average price of wholesale international E1 capacity" measures the affordability of international connectivity, and was appropriate for tracking the project objective of reducing prices. The project design also included an intermediate indicator "retail price of internet services" for tracking the project objective of reducing prices.

3.36 One shortcoming of M&E design was that there was no indicator to monitor service quality and reliability, even though these affect service usage.

3.37 **Implementation**: The project performance indicators and targets, as designed, were monitored during implementation by the implementing agency, AFAP. The data were collected on a semi-annual basis. However, there were some difficulties in obtaining the

data from the incumbent operator CST. The lag in data collection was, on average about six months. AFAP indicated to IEG that the agency was constrained because it did not have the human resources to carry out the monitoring of the project. AFAP obtained the information from the different project stakeholders such as the General Regulation Agency (AGER) and telecom operators.

3.38 One shortcoming is that the data on internet penetration rates were underestimated along the project cycle because mobile broadband technologies (3G and 4G) were not added to the number of fixed connections (DSL). This was only found at the time of project closure, when the indicator was being updated for the Implementation Completion and Results Report.

3.39 **Utilization**: The indicators were used for monitoring project progress. However, it is not clear whether the data collected were used to inform decision-making and resource allocation. Since project closure, the regulatory agency AGER is collecting the data from telecom operators on geographical coverage, internet users, and mobile phone users, because it provides this data to the ITU.

3.40 Overall M&E Quality Rating is rated **substantial**.

Achievement of the Objectives

3.41 As discussed under the Achievement of Objectives Section for CAB APL 1A, for assessing project efficacy, the PPAR considers three objectives (i) to increase the geographical reach of regional broadband network services (ii) to increase usage of regional broadband network services; and (iii) to reduce their prices.

3.42 To measure the first objective—geographical reach—two indicators are used: “mobile coverage” and “international communications bandwidth (internet, telecoms and data) per person.”

3.43 To measure the second objective—geographic usage—two indicators are used: “internet users per 100 inhabitants” and “total teledensity (active fixed and mobile subscribers per 100 inhabitants).”

3.44 To measure the third objective—reduced price—two indicators are used: “average monthly price of wholesale international capacity link” and “retail prices of mobile and internet services.”

Objective 1

3.45 The project has **substantially** achieved its development objective of increasing the geographic reach of regional broadband network services in São Tomé and Príncipe. The results are discussed immediately below.

Outputs

3.46 The main outputs relevant to this objective include:

- São Tomé Island was connected to the ACE submarine cable. The negotiations for the ACE Submarine cable were completed in November 2011, and ACE submarine cable became commercially effective in May 2013. The government established a SPV to enable equal access to multiple operators.

- The feasibility study for the connectivity of Príncipe Island was completed. At appraisal it was decided that the Príncipe Island would not be connected to the cable because of the high cost. The project, therefore, financed a study to explore options for connecting the residents of Príncipe Island, which included connecting Malabo-Príncipe-São-Tomé-Annabon. The study concluded that although investment by single operator would be difficult to justify on pure financial grounds, contributions could possibly be obtained by aggregating investment from the two operators, from other investors like oil companies operating in the country's territory, and from government, through the Universal Service Fund. By the end of the project both operators had started the deployment to upgrade the connection to Príncipe for higher capacity by installing separate microwave links. Príncipe Island is now connected by microwave radio transmission, which was funded by the government. IEG was informed that this is a limited solution and can respond to the need of the Príncipe Island for 10 to 15 years.

Outcome

3.47 The project substantially increased the geographical reach of internet and mobile connectivity in São Tomé and Príncipe. With the launch of the ACE submarine cable in February 2013, the international internet bandwidth, which measures the volume of international traffic—grew significantly, from 50 bits per second prior to the cable to more than 4,500 Mbps in 2014, much higher than the target of 500 Mpbs. Since 2014, the international internet bandwidth has further increased to 5,270 Mbps in 2017.

3.48 By the end of 2012, CST expanded its 3G network to cover 90 percent of São Tomé and Príncipe’s population. Currently 93 percent of the population is covered by 3G mobile phone network compared to 30% at appraisal. ICR reported that the percentage of localities with broadband access increased from 56 percent in 2010 to 100 percent in 2013, and this has been confirmed by IEG.

Objective 2

The objective, to contribute to increasing the usage of regional broadband network services, is **substantially** achieved.

Outputs

3.49 Access to the ACE submarine cable contributed to increased usage as wholesale and retail prices of ICT services dropped significantly (See Objective 3). In addition, the project included technical assistance to create an enabling environment for the ICT sector.

- Although the World Bank supported the drafting of the ICT Strategy, and modifications to the Telecom Law which included the legal framework to issue a

Universal Service Fund to create the enabling environment for the telecom sector, these measures have not been adopted (see Appendix B Table 3 for the status of the technical assistance provided by the project). IEG was informed that this was owing to changes in the government after the project closed.

- There are some pieces of legislation currently in force that relate to: (i) cybercrime protection; and (b) data protection. These are important because they protect the clients using internet services.

- The project provided technical assistance to support the preparation of the tenders for computer and internet access at the secondary schools and for telecenters that would be financed through the government's funds.

Outcome

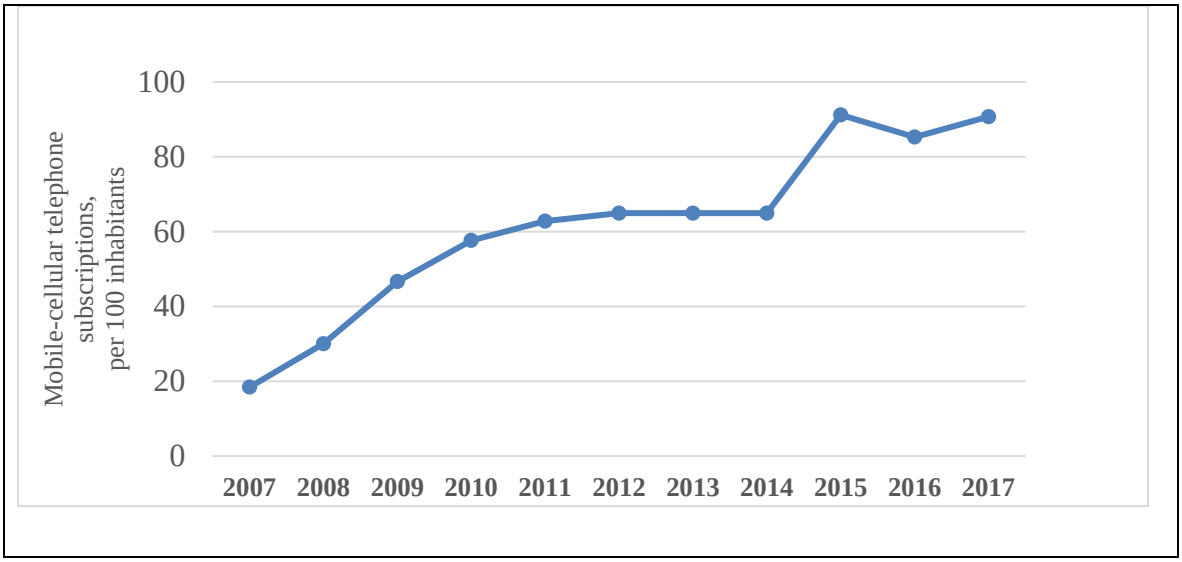
3.50 With the availability of high-speed broadband connectivity through the ACE submarine cable and the investments in the expansion of network by CST, the following achievements were made on increased usage:

- The outcome indicator, teledensity (number of mobile and fixed subscribers per 100 people), increased from 67 percent in 2010 to 87 percent at project closure and was about 95 percent in 2017.

- The number of internet users as a percentage of total population in São Tomé and Príncipe increased from 19 percent in 2010 to about 28 percent in 2017 (see Appendix B table 5).

- The access to mobile cellular phones (cellular phones per 100 people) increased from 58 in 2010 to 83 in 2014 at project closure, exceeding the target of 77. In 2017, the number of mobile cellular phones per 100 persons was 91. Figure 3.1 shows the increased trend in the number of mobile phone subscriptions (see Appendix B table 4). IEG was informed that although the incumbent operator still has a much bigger share of the market and is still the sole provider of some services like fixed line, there is some competition in various segments of the market. Subscribers can now make an informed decision when buying some services like mobile, international calls, and internet.

Figure 3.1. Mobile Cellular Telephone Subscriptions



Source: ITU

- The technical assistance provided by the project to support the preparation of the tenders for computer and internet access at secondary schools and telecenters has resulted in increased usage. Telecenters were implemented in six out of seven districts in São Tomé by INIC; half of them are functioning. These telecentres are rooms with 15 to 25 computers, connected to the internet, with one video projector, printer, and photocopy machine. These telecenters are important because users pay a small fee to access internet (about US$0.30). INIC indicated that telecenters in three districts are not fully functional. Table 3.1 shows the number of telecenter users for three districts for which data are available. The table shows that on average, about 15 percent of the computers were not working in the telecenters. The management of the telecenters is the responsibility of the local governments in the districts, who do not have adequate funds for maintenance. INIC provides technical assistance for the equipment when requested.

Table 3.1. Number of People Using the Telecenters

	District of Mezochi		***District of Agua Grande – National Library***	***Santana – District of Cantagalo***
	2014 (July)	2015 (May)	2015 (July)	2015 (August)
Total number of people at the center	1011	787	222	42
Female	567	317	95	2
Male	444	470	127	40
Number of computers working	23	20	18	13
Number of broken computers	3	6	2	2
Percentage of broken computers	11	23	10	13

Source: National Institute of Innovation and Knowledge.

- Video conference centers were set up at the Prime Minister's Office, the High Court of Justice, Foreign Affairs Office, European Union Country Office, and the University of São Tomé.

- At project closure (December 2014), 80 percent of public secondary schools (in total 26) were connected to the internet with WiFi technology; the remaining schools did not have electricity. However, it was reported to IEG that there are several schools where the internet is not working. AFAP reported that INIC was supposed to monitor the internet at school until the end of the project (2019). However, INIC has not assumed this role and has indicated that the beneficiary, should request the assistance of the IT Department of the Ministry of Education whenever there are issues regarding the internet service in schools. Therefore, there is no clear channel for the maintenance of the internet at schools, and there is no agency monitoring the system. No data are being collected on how many schools have well-functioning internet access. The distribution of tablets was not carried out because the local stakeholders did not approve the idea of tablet devices for schools.

- IEG was informed that there are several ICT usage projects in the pipeline being developed by INIC. These include: a geographical information system; an information system for school management; setting up of a government data center; electronic identification applications such as electronic registration of birth certificates, and an INIC data center. Once the legislation is passed, the government offices can start accepting e-signatures. The World Bank's education project (FY19) plans to connect primary schools.

Objective 3

3.51 The objective, to contribute to reducing the prices of services, is **substantially** achieved.

Outputs

- Tendering of a second license was completed as targeted in May 2013, and UNITEL was awarded the license to operate as a second operator in the telecom sector. This introduced competition in the telecommunication sector for the first time in the country.

- The project did not complete the setup of an IXP. The purpose of the IXP was to improve internet connectivity by enabling the Internet Service Providers to keep locally generated and received Internet traffic within the country, as opposed to carrying this traffic on international routes. At mid-term review, this activity was no longer a priority because there were few internet service providers and the number of websites hosted in São Tomé and Príncipe was low; an IXP would have had limited impact.

- Technical assistance and training were provided to AGER to develop and build capacity for the legal and regulatory amendments needed to reflect the new sector reality (submarine cable and competition). AGER staff were trained in the

following areas: economic cost model calculations, regulations for open access–based infrastructure, and establishment of interconnection tariffs between different operators (the government published the Interconnection Decree that set the legal basis for introducing competition in the telecommunications sector). Discussions with the AGER staff revealed that despite this training, the capacity of AGER to regulate the telecom sector is still weak, mainly because AGER lacks the necessary equipment to carry out its role as a regulator.

Outcome

3.52 In terms of prices, with the connection to the ACE submarine cable providing broadband access to São Tomé and Príncipe the cost of international connectivity dropped. The average monthly price of a wholesale international E1 capacity link dropped from US$9,000 in 2010 to US$2,500 at project closure in 2014, much lower than the target of US$4,500. The average monthly price of wholesale international capacity in 2017 is US$2,694. The wholesale prices in São Tomé and Príncipe fell 70 percent since the launch of ACE cable. This compares favorably with countries on the east coast of Africa where, one year after the arrival of the first fiber-optic cable, prices fell by 89 percent in Kenya, 64 percent in Madagascar, and 61 percent in Rwanda. In Togo, the price dropped by 87 percent.

3.53 With the entry of the second operator UNITEL, the existing telecom operator (CST) started offering different mobile and internet service packages to the population and the retail price for internet dropped substantially. The retail price of internet services at project closure in 2014 was about US$52 per month (40 euros per month), significantly lower than US$852 (640 euros per month) in 2010 and much lower than the target of US$340 per month. In 2017, the price was further reduced to US$31 per month (25 euros per month). Although the price was reduced significantly, internet service is still very expensive relative to income. The US$31 monthly price for internet is almost 20 percent of the average monthly income of the residents of São Tomé and Príncipe compared to less than 1 percent for many developed countries.

3.54 The average cost of a mobile local call decreased from US$0.42 (for three minutes) in 2010 to US$0.36 in 2017. The target of US$0.20 was not met. The average price of a mobile international call in 2017 was 75 cents/minute.

Efficiency

3.55 **Comparison with other alternatives**: At appraisal, the World Bank conducted an analytical review to compare the ACE submarine cable with other alternatives (buying satellite capacity or joining other submarine cable consortia) for improving international connectivity for São Tomé and Príncipe, and concluded that the ACE represented the preferred option given its associated long-term cost savings and higher bandwidth.

3.56 Even considering the high up-front costs for the ACE submarine cable, the bandwidth supply costing indicated that from 2020 onward, the ACE had the overall cost advantage, mainly because there are no intermediary links that need to be purchased and the traffic will land directly in Europe where global transit fees are highly competitive. In

addition, the investment costs are made up front in the consortium model, resulting in cost savings which are not available through the third-party supplier model.

3.57 The independent cable link option had considerably lower investment requirements than the ACE option, but its cost advantage is undermined by the need to also purchase upstream bandwidth to Europe from the landing site on the mainland. The independent cable option did have lower overall costs if bandwidth forecasts used were very conservative, but it is risky to base the choice of options on the expectation of low bandwidth demand. Therefore, the ACE submarine cable constituted the most cost-effective option for São Tomé and Príncipe to access high-capacity international connectivity

3.58 **Financial Efficiency**: The financial rate of return (FIRR) was conducted both at appraisal and at closure. It was estimated at 19 percent at appraisal. Key assumptions used in calculating the FIRR were: (i) the capital investment requirement of US$25 million over two years; (ii) the weighted average capacity of 5,500 Mbps; (iii) operating and maintenance expenses of US$439,000 annually over 10 years; and (iv) increases in internet penetration rates from 1 percent in 2011 to 10.1 percent in 2021.

3.59 The ex-post FIRR used the same methodology that was used at appraisal and used real data (2009–13), and with a re-estimation of forecasted figures from 2014 and onward. The appraisal model assumed an extremely low level of internet uptake: a 10 percent increase from 2010 to 2021; however, by December 2014 internet penetration was 18 percent. While the financial analysis looked at revenues from both the incumbent Telecom Operator (CST) and the expected second operator (UNITEL), it did not include the full effect of the UNITEL investment, and at project closure the introduction of the second operator remained uncertain. The ex-post FIRR was 19 percent.

3.60 **Economic efficiency**: Economic efficiency analysis was not conducted by the ICR.

3.61 **Administrative efficiency**: The project did not experience any cost or time overruns. The project generated additional revenue of US$8 million for the government through the sale of STP-Cabo shares and the awarding of the second license to UNITEL.

3.62 The project efficiency is rated **substantial**.

Ratings

OUTCOME

3.63 The project development objectives are highly relevant to the priorities of the country and the World Bank strategy for São Tomé and Príncipe. The relevance of design is also rated high because the project design logic—clear and realistic objectives supported by causally linked project activities was in general sound. The project design was comprehensive and can therefore be expected to fully deliver the outcomes. The achievement of all three objectives—increased geographical reach and usage of broadband network and reduction in price—is substantial. One minor shortcoming was the lack of adoption of the ICT Strategy and modifications to the Telecom Law prepared under the

project that affected further expansion of the sector, particularly usage. The project efficiency is substantial. The project outcome is rated **satisfactory**.

RISK TO DEVELOPMENT OUTCOME

3.64 **Government ownership/commitment risk.** The project funding provided São Tomé and Príncipe with the connectivity to the ACE submarine cable; the risk that there will be policy change regarding open access is low. The open-access principles embedded in STP- Cabo's structural documents guarantee that additional telecom operators will have open unfettered access to services under similar terms and conditions.

3.65 However, with the changes in government, there is a substantial risk that the legal documents prepared under the project may have become obsolete and will have to be revised and therefore may not be adopted.

3.66 **Institutional Risk:** The weak capacity of AGER to regulate and monitor the ICT sector poses a substantial risk for improved usage and good quality of service. Moreover, for sustained use of ICTs, lack of reliable energy supply poses is another risk which is assessed as modest.

3.67 **Economic Risk**: Taking into account the weak regulatory environment, the following substantial economic risk to achievement of development objectives is identified. The cost of internet is still very high, and there is a substantial risk that the project outcome relating to the reduction in price of internet usage of internet will not be sustained. This is mainly because of insufficient competition between the two operators: CST still holds the majority market share with UNITEL accounting for only 12 percent. Another reason is the small market size of the island, which prevents reduction in price. The number of subscribers can only increase to a certain extent; therefore, the retail price cannot go lower, and the two operators look for ways to sell their excess capacity. If new additional markets cannot be found, the high price will not go down further.

3.68 The risk to the project outcome of increased usage of internet and mobile services is assessed as substantial because of: (a) the very high cost of internet, (b) poor service quality, which is affected by lack of reliable energy, and (c) poor operations and maintenance of internet access in schools. Regarding the telecenters funded by the government, IEG was informed that the operations and maintenance risks to these telecenters are low because the price is deliberately kept low and maintenance will be funded by INIC resources.

3.69 The risk to development outcome is rated as **substantial**.

WORLD BANK PERFORMANCE

Quality at Entry

3.70 Project design reflected lessons learnt and built upon from previous similar projects implemented in the region. For example, Burundi Regional Communications Infrastructure Project entailed setting up a PPP to build a national backbone network. Experience under this project had underscored the need for solid financial, legal, and transaction-specific

expertise to implement the PPP arrangement. In view of the low capacity of the institutions involved in project implementation, the design included extensive technical assistance for designing PPP arrangements and other technical activities under the project. Other lessons included were: (a) the importance of client ownership for an efficient implementation of project activities—the project was designed in response to the government's specific request to the World Bank and the commitment to the reforms through a letter submitted to IDA on November 10, 2010; (b) infrastructure built without a suitable enabling environment can limit impact on prices and access—the project design included technical assistance to create the enabling environment; and (c) to overcome the limited availability and short supply of qualified staff for project management, procurement, and financial management—the project design proposed to use an existing Project Coordination Unit (PCU) for managing project and fiduciary aspects of the project.

3.71 The project was based on analytical work that identified the connectivity to the ACE as the best option for low-cost international connectivity for São Tomé and Príncipe. This involved a lot of legwork during preparation. To become a consortium member of the cable agreement, it was imperative that CST sign a Construction and Maintenance Agreement by June 5, 2010. This required highly complex negotiations between the Government and CST and Portugal Telecom that had to be concluded by that date. The project team assisted government in those negotiations; they resulted in São Tomé and Príncipe's successful participation in the ACE consortium, while ensuring the principles of open access to cable capacity for future operators. Instalment payments for the ACE membership fee were due before project approval with a first installment payment on July 23, 2010. Two Project Preparatory Advances (PPAs) were mobilized, an initial one to cover project preparation activities consisting mostly of technical assistance (US$0.7 million), and a US$5.0 million supplemental PPA to cover the initial payment to join the ACE consortium. By September 2010, US$5.2 million of the US$5.7 million had been disbursed.

3.72 The project benefitted from the IDA15 regional envelope which capped a country's contribution to regional projects at 20 percent of its yearly national IDA allocation, the balance coming from regional IDA funding (total IDA funding for the project was US$14.96 million, of which Regional IDA funding was US$14.43 million and National IDA funding was US$0.47 million).

3.73 The project design at entry proved to be appropriate and did not require any restructuring during the project's life cycle. The technical assistance put in place for project design, envisioning the outsourcing the infrastructure development to a private consortium with an open-access enabling environment and the introduction of competition, made this project design consistent throughout its implementation and ensured the project's success.

3.74 Overall, the quality at entry is rated **satisfactory**.

Quality of Supervision

3.75 The project was adequately supervised with an average of two supervision missions per year (in total seven supervision missions were carried out)[22]. An analysis of project documentation shows that the World Bank team responded adequately to project demands.

For instance, following the mid-term review in June 2013, a workshop was held to identify ICT priority projects to be financed with: (i) the remaining project funds; and (ii) funds that the government obtained from the second operator license and which it was committed to reinvest in the ICT sector. Following the workshop, agreement was reached that the funds which the government received from the second operator would be used for connecting all secondary schools to the internet and for purchasing computing devices for secondary schools.

3.76 The supervision team provided technical assistance to support the government in structuring the tenders for telecenters and computing devices for secondary schools. The key stakeholders indicated to IEG that the quality of the technical assistance was good.

3.77 According to the project documents, safeguards performance, fiduciary management, and procurement were all satisfactory (see implementation section for details).

3.78 The quality of supervision is rated **satisfactory**.

3.79 Because both the quality at entry and the quality of supervision are rated satisfactory, the overall World Bank performance is rated **satisfactory**.

BORROWER PERFORMANCE

Government Performance

3.80 There is no ministry of ICT in São Tomé and Príncipe. ICT is under the umbrella of the Prime Minister's office. During project preparation, the government was fully committed to the project. The government submitted to the World Bank a letter of sector policy dated November 10, 2010, which affirmed its commitment to open the mobile telecommunications sector to competition and improve the provision of international telecommunications bandwidth capacity in the country through a possible entry of new investors and/or telecommunications operators.

3.81 The government was also committed to implementing key sector reforms, namely the introduction of competition through the second global license. The second license to UNITEL was awarded in May 2013. As part of the package for the second license the government sold its 24.5 percent participation in STP-Cabo, thereby fully divesting, and keeping only a golden share that enabled it to guarantee open-access principles and safeguard the country's interests. The government received US$8 million from UNITEL (US$6.36 million for its shares in STP-Cabo and $1.62 million for the second global license) and decided to use the funds for promoting the ICT sector in the country. This was used to connect all secondary schools in São Tomé and Príncipe to the internet.

3.82 The main shortcoming on the part of the government was its failure to adopt the ICT strategy and other legislation prepared through the project's technical assistance. The strategy was not adopted at project closure and still has not been adopted. The strategy needs to be revised because the project prepared the strategy for the period 2014–17. IEG was informed that the reason for not adopting the strategy and the legislation was the

change in government. None of the key legislation prepared under project support have been adopted by the National Assembly.

3.83 The government performance is rated **moderately satisfactory**.

Implementing Agency Performance

3.84 AFAP was the Project Implementation Unit and was responsible for procurement, financial management, monitoring and evaluation, and implementation of environmental and social safeguards. Although AFAP had experience in implementing the World Bank financed projects in other sectors (education and social sector), there were minor delays in finalization of bidding documents and launching of tenders because this was a very different project requiring technical expertise. The World Bank provided technical assistance to build AFAP's capacity in telecom infrastructure and regulation. AFAP complied with the World Bank's fiduciary and safeguards policies. Overall, reports and audits were submitted in a timely and efficient fashion. AFAP remained adequately staffed throughout the project life with experienced financial and procurement managers as well as an accountant.

3.85 The specific government agencies, such as the General Regulation Agency (AGER) and National Institute of Innovation and Learning (INIC) demonstrated leadership by providing inputs to governments; also, they were the main counterpart for all the legal and regulatory reform work, and for the setting of STP- Cabo.

3.86 The main shortcoming during implementation was the delays in obtaining project indicators. AFAP informed IEG that during project implementation the agency did not have human resources to carry out timely monitoring of the project indicators because it had to rely on the operator (CST) for the relevant data. CST provided the data, with a lag.

3.87 The implementing agency performance is rated **satisfactory**.

3.88 Because the government performance was moderately satisfactory and implementing agency was satisfactory, overall Borrower performance is rated **moderately satisfactory.**

4. Lessons

4.1 **A thorough political economy assessment and high-level national and regional commitment are key ingredients for complex regional ICT projects.** The experience from CAB APL 1A illustrates that ICT reforms are politically difficult to implement due to the resistance and influence of incumbent operators. A thorough analysis of the political economy in all countries appears to be a critical tool to use during project preparation. It is essential that the political economy assessment identify high-level national champions (at senior positions close to the level of the President or Prime Minister) who can overcome political economy challenges. Commitment to the necessary reforms should be confirmed with official agreements. In addition, a communication campaign on planned reforms during project preparation and implementation, to sensitize stakeholders and get their continuous buy-in, is essential.

4.2 **The experience from the Central Africa Backbone APL 1 and 2 project shows that public private partnership arrangements are difficult to implement in multiple countries, particularly when countries have asymmetrical needs and incentives with respect to increasing competition for the provision of international and national capacity.** In CAB 1B, Cameroon perceived the regional PPP as an option imposed by the World Bank from above, considering it as an infringement on their sovereignty; consequently, they rejected the approach. This was also partially because Cameroon had less incentive to take part in the regional PPP, because it already had access to submarine cables and most of its national backbone was already built. Therefore, Cameroon withdrew its participation in the second phase of the project. Chad followed Cameroon and proceeded to have its national backbone built under a separate contract, creating a separate company in early 2012 to manage its fiber optic network in direct contradiction to the regional PPP envisaged under the project. On the other hand, in CAB APL 2, the existence of an upstream regional multi-country project (the Africa Coast to Europe-ACE) connecting up to 23 countries, facilitated the effective connection and implementation of public private partnership arrangement in São Tomé and Príncipe. This was achieved as the implementation happened separately within each country jurisdiction based on regionally agreed parameters.

4.3 **Technical assistance for the preparation of legislation and sector strategies is only the first step to creating an enabling environment for the ICT sector.** The technical assistance can be effective if projects include sufficient resources to adopt legislations and strategies. In CAB APL 1A, there was a need for additional funds to implement the result of the studies developed by the project technical assistance. In Cameroon, for example, the regulatory agencies had to look for additional resources to implement some of the study recommendations.

4.4 **Assessing and funding the capacity needs of Regional Economic Communities is important for project coordination and implementation, so that they can carry out their functions effectively.** Regional institutions perform important roles, such as convening countries, securing their political commitment; helping them take collective decisions; playing an advocacy role; and performing M&E functions at the regional level. The project experience showed that CEMAC was effective during project design and negotiations but lacked capacity during implementation, particularly on M&E. The World Bank could have supported its needs through better use of its own influencing and coordinating power.

4.5 **In weak capacity environments, it is beneficial that the projects build the needed institutional capacity for the Borrower to further/implement the crucial reforms and to ensure the sustainability of the investments in the country.** For example, in APL2**,** the prepared regulations and ICT strategy were not adopted after the project was closed. In addition, although the project connected schools to the internet through last mile investments with planned O&M activities, lack of institutional capacity for monitoring and follow up made the results unsustainable.

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[1] IDA 2010, "Information and Communication Technologies in IDA Countries: New Opportunities for Connecting People, Transforming Service Delivery, and Fostering Innovation," Report No: 91587.

2 Project Appraisal Document (p. 1–2).

[3] The investment would result in a public-private partnership, which was supposed to take the form of a fiber-optic network concession for national and international networks. For the national networks (called national-CAB), each government was to create a holding company to own the fiber-optic network in its territory and would select, through a tender, a concession holder to finance, build, and manage the network. The government would then own a share in the concession holder. Funding would be provided by countries' institutional partners and the private sector. For the international network (called international-CAB), the governments were to award to a Management Company, selected through a global tender organized by the CEMAC Commission and controlled by the two governments, (i) a sui generis concession contract to develop, manage, and maintain a network. The Management Company was to take the form of a holding company which would own an operating company in each country.

[4] CAB APL 3, 4 and 5 are still active.

[5] When a program is implemented in separate phases in the same countries, it is called vertical APL. Horizontal APLs are implemented in different countries under the same program.

[6] Project Appraisal Document (p. 4)

[7] Project Appraisal Document (p.4).

[8] Project Appraisal Document (p.5).

[9] Project Appraisal Document (p. 12).

[10] Financing Agreements for Cameroon (Schedule 1, page 6), Chad (Schedule 1, page 4), Central African Republic (Schedule 1, page 6).

[11] World Bank: *World Development Report 2016: Digital Dividends*; Cameroon Systematic Country Diagnostic, June 20, 2016; Recovery and Peacebuilding Assessment for Central African Republic, jointly prepared by the World Bank, United Nations (UN) and the European Union (EU); International Development Association Turnaround Eligibility Note for the Central African Republic, September 27, 2016; and Chad Country Partnership Framework for the 2016-2020 period.

[12] Document Stratégique pour la croissance et l'emploi.. Implementation of this strategy relies on: (i) a review of the legal, regulatory, and governance framework; (ii) improvement of the service offering in terms of quantity, quality, and affordability; and (iii) an increase in ICT usage as well as the strengthening of the ICT business ecosystem.

[13] Prior to the midterm review in May 2013, the disbursement rate was 31 percent for Cameroon, 55 percent for the Central African Republic, and 26 percent for Chad.

[14] In most countries of the world, fixed-broadband services cost between US$10 and US$40; in the Central African Republic and Chad it is above US$400, according to the International Telecommunications Union.

[15] Economist Intelligence Unit Country report on São Tomé and Príncipe, February 27, 2018.

[16] http://www.worldbank.org/en/country/saotome/overview

[17] Economist Intelligence Unit Country report on São Tomé and Príncipe, February 27, 2018.

[18] Project Appraisal Document.

[19] Project Appraisal Document.

[20] Project Appraisal Document.

[21] Implementation Completion Report.

[22] The length of the project was three years; it was approved on January 20, 2011 and closed on December 31, 2014.

Appendix A. Basic Data Sheet

I. CENTRAL AFRICAN BACKBONE P108368 (CREDIT IDA-46470, GRANT IDA-H5150, GRANT IDA-H5160)

Key Project Data (amounts in US$ million)

	Appraisal estimate	*Actual or current estimate*	*Actual as % of appraisal estimate*
Total project costs	26.7	24.2	90.6%
Loan amount	26.7	24.2	90.6%
Cofinancing			
Cancellation			

Cumulative Estimated and Actual Disbursements

	FY10	*FY11*	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*
Appraisal estimate (US$M)	4	10	16	19	22	25	26.2
Actual (US$M)	0	1.8	4.9	8.6	10.9	20.1	24.2
Actual as % of appraisal	0	18%	30.6%	45.2%	49.5%	80.4%	91.6%
Date of final disbursement:							

Project Dates

	Original	*Actual*
Board approval		09/24/09
Effectiveness		02/12/10
Closing date	03/15/2016	3/15/2016

Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank budget only)	
	Staff Weeks (number)	*US$ 000s (including travel and consultant costs)*
Lending		
FY 08	23.68	146.0
FY 09	48.70	307.5
FY10	19.87	105.1
Total	**92.25**	**558.6**
Supervision/ICR		
FY 10	3.99	72.2
FY 11	20.25	109.3
FY 12	22.32	140.3
FY 13	20.19	148.4
FY 14	14.01	115.0
FY 15	17.71	119.7
FY 16	7.95	68.9
FY 17	19.13	80.2
Total	**125.55**	**854.0**

Task Team Members

Name	*Title (at time of appraisal and closure, respectively)*	*Unit*	*Responsibility/Specialty*
Lending			
Mavis A. Ampah	Lead ICT Policy Specialist	GTI11	
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Abdoulaye Seck	Country Manager	EACMM	
Supervision/ICR			
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2. CENTRAL AFRICAN BACKBONE APL 2 -P117652 (GRANT IDA-H6420)

Key Project Data (amounts in US$ million)

	Appraisal estimate	*Actual or current estimate*	*Actual as % of appraisal estimate*
Total project costs	14.9	15.06	101%
Loan amount	14.9	15.06	101%
Cofinancing			
Cancellation			

Cumulative Estimated and Actual Disbursements

	FY11	*FY12*	*FY13*	*FY14*	*FY15*	*FY16*
Appraisal estimate (US$M)	9.5	14.1	14.6	14.9	14.9	14.9
Actual (US$M)	0	11.8	14.2	14.7	14.9	15.06
Actual as % of appraisal	0	83.6%	97.2%	98.6%	100%	101%
Date of final disbursement:						

Project Dates

	Original	*Actual*
Board approval		01/20/2011
Effectiveness	04/22/2011	07/06/2011
Closing date		12/31/2014

Staff Time and Cost

	Staff Time and Cost (Bank budget only)	
Stage of Project Cycle	***Staff Weeks (number)***	***US$ 000s (including travel and consultant costs)***
Lending		
FY10	30.64	207.7
FY11	28.63	138.5
FY12	.68	2.7
Total	**59.95**	**348.9**
Supervision/ICR		
FY12	6.11	34.2
FY13	10.2	70.1
FY14	10.85	72.9
FY15	4.23	4.9
Total	**31.21**	**219.1**

Task Team Members

Name	*Title (at time of appraisal and closure, respectively)*	*Unit*	*Specialty*
Lending			
Isabel Neto	Senior Operations Officer	GEEDR	Task Team Leader
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Yann Burtin	Senior Underwriter	MIGOP	
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Appendix B. Other Data Appendixes

Table B1: Cameroon—State of utilization of studies carried out under CAB 1A
(as of November 2017)

	Activity	Purpose	Results obtained	Implementation Status
1.	Establishment of a legal and regulatory framework for electronic communications (MINPOSTEL) Cost: $305,867 Year of completion: 2010	Assist the government in the implementation of the tools of the Information Society, with missions to assist the government in the review of the three draft laws, to develop the texts of application of the said laws, to propose the texts and amendments to existing texts	Draft texts of laws and proposed implementing texts	The results of this study were used in the drafting of the laws promulgated in 2010 and 2015 in particular: the laws on cybersecurity, cybercrime, electronic commerce and consumer protection, and the texts of applications related thereto from 2012. They have allowed the transposition to over 90 percent in national laws, CEMAC and ECCAS directives.
2.	Tax and Fiscal Study of the Telecommunications Sector (MINPOSTEL) Cost: 92 476 816 FCFA Year of completion: 2015	Study the taxation of the Telecommunications and ICT sector in Cameroon so as to know ultimately the degree of taxation of infrastructure, products and services, and telecommunications terminals, and propose an appropriate tax policy to boost access and telecommunications service	Critical analysis of all the tax provisions applicable to the telecommunications and ICT sector available	Not implemented
3.	Study for the implementation of a Waste Management Center for Electrical and Electronic Equipment (D3E) (MINPOSTEL)	Respond to the flow of e-waste in the context of the transition from analog to digital (DSO) in the audiovisual. The aim of the	The study proposed a two-level strategy: • The D3E management center to be set up in Douala and/or	Not implemented

	Activity	Purpose	Results obtained	Implementation Status
	Cost: 98,075,000 FCFA Year of completion: 2016	study was to prepare the establishment of a center for the treatment of electrical and electronic waste in Cameroon with a sub-regional vocation to answer three challenges: - Environmental - Health - Job creation opportunity	Yaoundé will be responsible for collecting, dismantling, processing, and upgrading • The other provincial capitals and university town will collect, dismantle, and revalue with the mobile collection center in the surrounding cities	
4.	Study for the implementation of a public-private partnership for the deployment of an inter-urban transmission operator and the development of evolution scenarios for CAMTEL (MINPOSTEL) Cost: $US350,050 Year of completion: 2011	Refresh the SITELCAM study and propose CAMTEL evolution scenarios	Proposal by the cabinet of the structural separation option which advocates the splitting of CAMTEL into two distinct legal societies: one dealing with access and the other with the national backbone.	Selected option presented to the Interministerial Committee at the CTPL in 2013 and to the Prime Minister, Head of Government; The implementation of the results of this study is still expected
5.	Development of a submarine cable operating procedures document in Cameroon: case of WACS (MINPOSTEL) Cost: 34,620,780 CFAF Year of completion: 2016	Propose a mode of governance and management of landing points and in particular, that of the cable WACS, which will involve all stakeholders in the private and public sectors	A white paper on a mode of governance and management of landing points and in particular, that of the WACS cable proposed.	Not implemented.
6.	Cross-border interconnection study of Cameroon with neighboring countries (MINPOSTEL) Cost: 49,826,500 CFAF Year of completion: 2016	Conduct a techno-economic study for the interconnection of the national backbone to the fiber-optic networks of neighboring countries, to be taken into account in the Master	Decision support document available	Study having served as inputs for obtaining AfDB financing for optical fiber laying projects in cross-border areas currently underway

	Activity	Purpose	Results obtained	Implementation Status
		Plan for Digital Interconnections in CEMAC/CEEAC zone		
7.	Feasibility study for setting up a national and regional internet exchange point (IXP) in Cameroon (ANTIC) Cost: €181,000 Year of completion: 2013	Assist ANTIC to set up an IXP so that it can retain local traffic in order to reduce the costs of Internet access, improve the quality of services and make citizens more secure on the Internet.	• Comparative techno-economic feasibility study of the data transport and Internet available segment; • Comparative review of national legal and regulatory frameworks and identification of development scenarios for institutional frameworks produced; • Feasibility study on the implementation of a National and Regional IXP and specifications for the establishment of a National and Regional IXP available.	Two National IXPs built in Yaoundé and Douala
8.	Definition and implementation of a strategy for the management of the Internet domain .cm (ANTIC) Cost: CFAF 200,000,000 Year of completion: 2015	• Define a management strategy. • Develop the plan and identify activities for implementing this strategy	Strategy and implementation plan available	• Strategy that enabled the production of the ".cm" naming charter; • 63,000 ".cm" domain names registered by ANTIC • 15 "Registrars" registration offices of the approved .cm • 04 "Local Internet Registry" authorized
9.	Study on the analysis, design, and development of a government web portal in Cameroon (ANTIC)	Develop a government web portal unifying services and online administrative procedures to improve the quality of services	Technical specifications of the available web portal	The search for financing for the purchase of equipment for its implementation is outstanding

	Activity	Purpose	Results obtained	Implementation Status
	Cost: CFAF102,240,000 Year of completion: 2015	offered to users by the public administration.		
10.	Design and implementation of regulatory instruments for wholesale markets, retail markets, promotional offers for telecommunications services (ART) Cost: €366,561 Year of completion: 2014	Update the regulator's regulatory model, define relevant markets, and develop retail regulation tools and applicable promotional offers.	Regulatory tools for wholesale, retail, and promotional offers available	The implementation of the recommendations of this study is not yet perceived at the ART level
11.	Establishment of the frequency management system and the drafting of the call for tenders for the purchase of management equipment and control of the frequency spectrum and associated services (ART)	- Have a frequency management system - Have a DAO (CAD) for the acquisition of frequency control equipment	Proposals made on: - the allocation table of the bands of RAS - technical specifications for revision of the regulatory framework of frequencies - capacity building of staff in frequency management.	Table of allocation of frequency bands used by the Regulator. Acquisition of equipment that led to the purchase, installation, and use of such equipment.
12.	Development of a model for determining the costs of training human resources in the telecommunications and ICT sector (ENSPT) Cost: CFAF87,207,023 Year of completion: 2015	Develop a model for determining the costs of human resources training in the telecommunications and ICT sector in order to control the costs of training at various levels of the sector.	• Software on the determination of elaborated costs; • Technical documentation available; • Personnel trained in the use of the software.	Model used to determine SUP'PTIC human resources training costs
13.	Development of a techno-economic feasibility study of technological innovation centers and digital economy in order to implement technopoles in the field of ICT in Cameroon	Have an implementation study of a technopole on the regulatory and technical-economic-financial level.	• ToR and DAO for the implementation of the developed project.	The second phase of this activity is being implemented as part of ADB financing (study of an ICT Technopole in Cameroon)

	Activity	Purpose	Results obtained	Implementation Status
	(MINMIDT) Cost: FCFA 91,638,931 Year of completion: 2015			
14.	Study for the use of solar energy in the fiber-optic networks of CAMTEL (National Backbone with fiber optics) (CAMTEL) Cost: CFAF71,400,000 Year of completion: 2014	Have a study by sun zone for the use of solar energy in fiber optic networks	• Feasibility study and technical specifications by area of sunshine available; • Seminar or workshop organized in Ebolawa, Garoua, Douala, and Bafoussam	Implementation Assistance Document
15.	Study of electronic management, scanning and electronic archiving of CAMPOST documents (CAMPOST) Cost: CFAF 19,576,250 Year of completion: 2014	Implement CAMPOST's digital document management and electronic archiving system to secure them, facilitate searches and expedite service to clients.	TDR and DAO for the selection of a consultant responsible for setting up the electronic document and archives management system applicable within CAMPOST.	Implementation of this activity is planned as part of AfDB financing
16.	Study on the establishment of a hybrid mail service in Cameroon (CAMPOST) Cost: CFAF69 334 655 Year of completion: 2014	Develop the strategy for the implementation of the “Hybrid Mail” service at CAMPOST to meet the needs of customers while creating added value.	• State of the mails of large emitters, at least two proposed hybrid mail deployment solutions • Specifications for the selection of a consultant to implement the proposed solution	The implementation of this activity is planned as part of AfDB financing.

Types of Broadband Connections[xxiii]

The term broadband commonly refers to high-speed internet access that is always on and faster than the traditional dial-up access. Broadband includes several high-speed transmission technologies such as:

- Digital Subscriber Line (DSL)
- Cable Modem
- Fiber
- Wireless
- Satellite
- Broadband over Powerlines (BPL)

The broadband technology you choose will depend on a number of factors. These may include whether you are located in an urban or rural area, how broadband Internet access is packaged with other services (such as voice telephone and home entertainment), price, and availability.

Digital Subscriber Line (DSL)

DSL is a wireline transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses. DSL-based broadband provides transmission speeds ranging from several hundred Kbps to millions of bits per second (Mbps). The availability and speed of your DSL service may depend on the distance from your home or business to the closest telephone company facility.

The following are types of DSL transmission technologies:

Asymmetrical Digital Subscriber Line (ADSL) – Used primarily by residential customers, such as Internet surfers, who receive a lot of data but do not send much. ADSL typically provides faster speed in the downstream direction than the upstream direction. ADSL allows faster downstream data transmission over the same line used to provide voice service, without disrupting regular telephone calls on that line.

Symmetrical Digital Subscriber Line (SDSL) – Used typically by businesses for services such as video conferencing, which need significant bandwidth both upstream and downstream.

Faster forms of DSL typically available to businesses include:

High data rate Digital Subscriber Line (HDSL); and

Very High data rate Digital Subscriber Line (VDSL).

Cable Modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

Most cable modems are external devices that have two connections: one to the cable wall outlet, the other to a computer. They provide transmission speeds of 1.5 Mbps or more.

Subscribers can access their cable modem service by simply turning on their computers, without dialing-up an ISP. You can still watch cable TV while using it. Transmission speeds vary depending on the type of cable modem, cable network, and traffic load. Speeds are comparable to DSL.

Fiber

Fiber optic technology converts electrical signals carrying data to light and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps.

The actual speed you experience will vary depending on a variety of factors, such as how close to your computer the service provider brings the fiber and how the service provider configures the service, including the amount of bandwidth used. The same fiber providing your broadband can also simultaneously deliver voice (VoIP) and video services, including video-on-demand.

Telecommunications providers sometimes offer fiber broadband in limited areas and have announced plans to expand their fiber networks and offer bundled voice, Internet access, and video services.

Variations of the technology run the fiber all the way to the customer's home or business, to the curb outside, or to a location somewhere between the provider's facilities and the customer.

Wireless

Wireless broadband connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. Wireless broadband can be mobile or fixed.

Wireless technologies using longer-range directional equipment provide broadband service in remote or sparsely populated areas where DSL or cable modem service would be costly to provide. Speeds are generally comparable to DSL and cable modem. An external antenna is usually required.

Wireless broadband Internet access services offered over fixed networks allow consumers to access the Internet from a fixed point while stationary and often require a direct line-of-sight between the wireless transmitter and receiver. These services have been offered using both

licensed spectrum and unlicensed devices. For example, thousands of small Wireless Internet Services Providers (WISPs) provide such wireless broadband at speeds of around one Mbps using unlicensed devices, often in rural areas not served by cable or wireline broadband networks.

Wireless Local Area Networks (WLANs) provide wireless broadband access over shorter distances and are often used to extend the reach of a "last-mile" wireline or fixed wireless broadband connection within a home, building, or campus environment. Wi-Fi networks use unlicensed devices and can be designed for private access within a home or business, or be used for public Internet access at "hot spots" such as restaurants, coffee shops, hotels, airports, convention centers, and city parks.

Mobile wireless broadband services are also becoming available from mobile telephone service providers and others. These services are generally appropriate for highly-mobile customers and require a special PC card with a built-in antenna that plugs into a user's laptop computer. Generally, they provide lower speeds, in the range of several hundred Kbps.

Satellite

Just as satellites orbiting the earth provide necessary links for telephone and television service, they can also provide links for broadband. Satellite broadband is another form of wireless broadband, and is also useful for serving remote or sparsely populated areas.

Downstream and upstream speeds for satellite broadband depend on several factors, including the provider and service package purchased, the consumer's line of sight to the orbiting satellite, and the weather. Typically a consumer can expect to receive (download) at a speed of about 500 Kbps and send (upload) at a speed of about 80 Kbps. These speeds may be slower than DSL and cable modem, but they are about 10 times faster than the download speed with dial-up Internet access. Service can be disrupted in extreme weather conditions.

Broadband over Powerline (BPL)

BPL is the delivery of broadband over the existing low- and medium-voltage electric power distribution network. BPL speeds are comparable to DSL and cable modem speeds. BPL can be provided to homes using existing electrical connections and outlets. BPL is an emerging technology that is available in very limited areas. It has significant potential because power lines are installed virtually everywhere, alleviating the need to build new broadband facilities for every

[xxiii] https://www.fcc.gov/general/types-broadband-connections

Appendix B Table 2: Status of Technical Assistance Provided by the CAB 2A in São Tomé and Príncipe

Component	Activity	Output (at project closure)	Status (as of March 5, 2017)
Component 1-Enabling Environment			
Technical assistance for legal and regulatory reform, to develop public-private partnership (PPP) arrangements for the infrastructure to be developed and to launch a second mobile telecommunications operator, environmental studies and M&E support.	Technical Assistance provided to modernize and harmonize legal and regulatory framework the ICT Sector.	Bill for the Modification to the Telecom Base Law was prepared. It aimed at reflecting the new reality in the Telecom sector, namely the regulation for infrastructure and open access principle. In mid-2014, the government approved the bill, but pending the approval by National Assembly.	The Telecom Base law was approved by the Government but was never approved at the National Assembly (Laws must be approved at the National Assembly) and therefore never entered into force. Recently the General Regulation Agency (AGER) proposed new upgrades to the bill to the modification of the Telecom Base Law. It is pending approval by the government to be then submitted to the National Assembly.
	ICT Strategy Plan	ICT Sector Strategy, which provides a comprehensive framework to continue promoting ICT across the country. It established, for the first time, objectives, roles, responsibilities, monitoring measures, etc. to harness the best potential of ICT in São Tomé and Príncipe. In 2012, an ICT strategy was prepared and at the end of	The ICT Strategy was not adopted by the National Assembly.

		2014 was approved by the government but adoption is pending.	
	Technical assistance provided for tendering of the second global license.	In May 2013, the second license was awarded to UNITEL International Holding BV and on July 2014 UNITEL launched their commercial activities meaning the arrival of competition in the Telecom sector for first time in the country.	UNITEL is operating as the second operator in the market.
	Technical assistance to improve access to ICT service in rural areas and to structure PPP investments.	Three projects were structured: • Internet connection to secondary schools: On July 2014 a tender was launched that resulted in a contract awarded to CST on August 2014. By the end of the project all 27 secondary schools were connected to Internet with Wi-FI technology. The implementation of this contract project was funded with the project proceeds. • Telecenters: On October 2014, the tender documents for the establishment of four telecenters in underserved areas were delivered to the government. • ICT devices for secondary schools: On October 2014, the design and bidding documents for the provision of low cost tablet devices to secondary students and teachers was also delivered to the government.	• Internet connection to Secondary Schools: CST implemented the project but there are many issues with the project. Right now, there are schools were the internet is not working. The Fiduciary Agency for Project Administration (AFAP) reported that the National Institute of Innovation and Knowledge (INIC) was supposed to monitor the internet at school until the end of the project (2019). However, INIC has not assumed this role and indicated that the beneficiary, that is, the IT Department of the Ministry of Education should request their assistance whenever there are issues regarding the internet service in schools. Therefore, there is no clear

		The implementation of the two latter projects is subject to government approval of the use of its own funds received from the introduction of UNITEL.	channel for the maintenance of the internet at schools, and there is no agency monitoring the system. No data are being collected on how many schools have well-functioning internet access. • Telecenters were developed in all districts but one—in total six telecenters were established. They are operating and are managed by the local authorities and with the technical supervision of INIC. • ICT devices for secondary schools: This was not implemented because the local stakeholders did not approve the idea of tablet devices for schools.
	Technical assistance provided to AGER for the establishment of interconnection tariffs between different operators.	Interconnection Decree — on September 2014, the government published the Interconnection Decree which set the legal basis for interconnection given the arrival of competition in the Telecom sector. On July 2014, interconnection tariffs were established through and agreement between	The Interconnection Decree in force now is the one of 2007. The modifications prepared with the World Bank's assistance never entered into force since it had references to the new modification of the Telecom Base Law which was not adopted.

		CST and UNITEL allowing mobile subscribers to call regardless operator.	Interconnections tariffs are in place and functioning. Initially they were asymmetric in favor of UNITEL. AGER has supervised the agreement between the two companies. Now the tariffs are equal for the two operators. The interconnection tariffs are now 0.05€/minute. The existing agreement between the two companies ends this year and AGER will supervise the negotiation of new agreement and impose lower tariffs.
	Technical assistance carried out to build capacity within AGER to develop economic cost model calculations.	Completed.	
	Technical assistance provided to AGER to update Universal Service Fund legal foundations	In October 2014, an updated Universal Service Fund proposal was prepared and delivered. Its implementation depends on the approval of the modifications to Telecom law bill, which is still outstanding and is expected for 2015.	The proposal never entered into force as it is awaiting the adoption of the modifications to Telecom base law bill. AGER complained that it is difficult to carry out part of their functions without this bill.
	Environmental studies and Monitoring and Evaluation	Studies were duly completed and the São Tomé and Príncipe cable landing station installation was done in compliance with safeguards regulation. All compensation	Confirmed.

		that were due were calculated and successfully paid to the affected people.	
Connection to the Island of Príncipe	Study of options to improve connectivity of Príncipe Island	An assessment of options to improve Príncipe's connectivity was carried out. This resulted in the two operators upgrading their microwave links to Príncipe to better serve the population in that island. It also identified scenarios for extending the submarine cable to Príncipe. This has resulted in high-level contacts with the government of Equatorial Guinea with the objective of possibly developing a joint investment. These discussions are still ongoing.	• AGER tried with no success to convince the two operators to invest together in the upgrading of the microwave links to Principe. Each developed their own infrastructure. • UNITEL microwave link works better than the CST which in the days of rain has poor performance. • The discussions with the government of Equatorial Guinea with the objective of possibly developing a joint investment are still ongoing.

Table B3: Number of Mobile Cellular Subscriptions in São Tomé and Príncipe

	Mobile-cellular telephone subscriptions	Mobile-cellular telephone subscriptions per 100 inhabitants
2002	1,980	1.37
2003	4,819	3.27
2004	7,745	5.13
2005	11,953	7.73
2006	18,424	11.60
2007	30,099	18.42
2008	50,551	30.04
2009	80,829	46.66
2010	102,730	57.64
2011	115,038	62.80
2012	122,172	64.95
2013	125,329	64.94
2014	128,500	64.94
2015	184,971	91.22
2016	177,102	85.28
2017	181,500	90.75

Source: ITU

Table B4: Internet users by number and as a percentage of total population in São Tomé and Príncipe

Year	Total Population	Internet Users	Penetration (% of Population)
2000	137,164	6,362	4.6%
2001	140,003	8,835	6.3%
2002	143,085	10,847	7.6%
2003	146,357	14,873	10.2%
2004	149,732	19,949	13.3%
2005	153,146	21,072	13.8%
2006	156,584	22,207	14.2%
2007	160,064	23,354	14.6%
2008	163,595	25,325	15.5%
2009	167,196	27,437	16.4%
2010	170,880	32,040	18.8%
2011	174,646	35,211	20.2%
2012	178,484	38,503	21.6%
2013	182,386	41,949	23.0%
2014	186,342	45,486	24.4%
2015	190,344	47,977	25.2%
2016	194,390	49,686	25.6%
2017	199,999	55,745	27.9%

Source: http://www.internetlivestats.com/internet-users/sao-tome-and-principe/

Appendix C. List of Persons Met

CAB APL 1A

Cameroon

African Development Bank

Mr. Ali Cisse, *Country Program Officer*

Cameroon Telecommunications (CAMTEL)

Mr. Dr. Alain Ate, *Deputy General*

Mr. Evariste Dieutoss, *Project Director*

Cameroon Post (CAMPOST)

Mr. Mamadou Hamaselbe, Director

Ministry of Cooperation and Regional Integration (MINEPAT)

Mr. Guy Ronel Nguemaleu, *Deputy Director of Multilateral Cooperation*

Ministry of Posts and Telecommunications (MINEPOSTEL)

Ms. Minette Libom Li Likeng, *Minister*

Ms. Pauline Tschafak, *Director of Regulation*

Ms. Marie Mathilde Eyong/Ondo, *Accountan*t

Mr. Christian Meyeng Abath, *Technical Coordinator*

National Agency for Information and Communications Technologies (ANTIC)

Mr. Ebot Ebot Enaw, *Director General*

Mr. Bouba Djamaa, *Assistant Director*

National Institute of Statistics

Mr. Joseph Tedou, *Director*

Orange Mobile Phone Company

Mr. Kone Christian, Director

Project Coordination Unit

Mr. Pierre Sonfack, *Coordinator*

Mr. Joseph Richard Mbah Tsoungui, *Procurement Market Specialist*

Telecommunications Regulatory Board (ART)

Mr. Philemon Zoo Zame, *General Director*

Mr. Sosthene Bounoung Essono, *Director*

Mr. Mengang Bekono, *Technical Director*

The World Bank

Ms. Elisabeth Huybens, *Country Director*

Mr. Jerome Bezzina, *Project TTL*

Ms. Gina Bowen, *Operations Officer*

Chad

Airtel

Mr. Djibril Tobe, *General Director*

Mr. Abdelhamid Mahamat Senoussi, *Administrator*

Mr. Laurent Bouda, *Network Director*

Authority of Regulation of Postal and Electronic Communications (ARCEP)

Mr. Ali Sidick Adam, *Control and Inspection Director*

Ministry of Finance and Budget

Mr. Abdoulaye Barh Bachar, *Secretary General*

Ministry of Post and New Information Technologies

Mr. Haroun Mahamat Badaouy, *Technical Advisor*

Mr. Hissein Brahim Abdelkerim, *General Secretary*

Mr. Ndjerabe Ndjekoundade

Technologies Development of Information and Communications Agency (ADETIC)

Mr. Sedik Ali Haouane, *Director*

Telecommunications Company of Chad (SOTEL)

Mr. Mahmoud Badou, Manager

The World Bank

Mr. Ziva Razafintsalama, *Acting Country Manager, Senior Agricultural Economist*

CAB APL 2

AGER

Candido Frota, Chairman

Silvino Palmer, Member of the Board responsible for the Financial and Administrative Sector

Artur Trindade, Member of the Board of Administration responsible for the Technical Sector

Antonio Lomba, Head of the Telecommunications Department

Legiliso Viana, Technician at the Department of Studies and Planning

INIC

Inocêncio Costa, Director

CST and STP CABO

STP Cabo is managed by CST that owns 75% of its shares. Therefore, the meeting with CST and STP CABO were held together. The following persons were present, representing the two companies:

Wilson Ten-Jua, Financial Director of CST and member of the board of STP CABO;
Emery D'Alva, Marketing Director of CST and member of the board of STP CABO;
Walker Viana, Technical Director of CST and member of the board of STP CABO;

UNITEL

Vieira Sapalo, Technical Director.

AFAP

AFAP was the Project Implementation Unit of the Central Africa Backbone Program APL2 in Sao Tome.

Alberto Leal, Director

The World Bank

Maria Isabel A. S. Neto, Senior Energy Specialist

Antonio Adolonimo de Barros Amaral Aguiar, Local Consultant