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Report No: ICR00004736

IMPLEMENTATION COMPLETION AND RESULTS REPORT

(4974-CG, 5991-CG)

ON A CREDIT IN THE AMOUNT OF SDR 9,400,000
(US$15 MILLION EQUIVALENT)

AND

ON A CREDIT IN THE AMOUNT OF SDR 3,700,000
(US$5 MILLION EQUIVALENT)

TO THE

Republic of Congo

FOR THE

AFCRI-Central African Backbone - APL3 - Republic of Congo

October 29, 2019

Digital Development Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective February 28, 2019)

Currency Unit =	C.F.A Francs BEAC (XAF)
XAF 574.51 =	US$1
US$1.40 =	SDR 1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ACE	Africa Coast to Europe
AfDB	African Development Bank
AF	Additional Financing
APL	Adaptable Program Loan
ARPCE	*Agence de Régulation des Postes et des Communications Electronique* (Regulatory Agency for Post and Electronic Communications)
CAR	Central African Republic
CEEAC	*Communauté Économique des États de l'Afrique Centrale* (Economic Community of Central African States)
CEMAC	*Communauté Economique et Monétaire des Etats de l'Afrique Centrale* (Economic and Monetary Community of Central Africa)
CGIX	Congo Internet Exchange
CPS	Country Partnership Strategy
DDF	Digital Development Fund
DGDEN	*Direction Générale du Développement de l'Économie Numérique* (Directorate General for the Digital Economy)
DGE	*Direction Générale de l'Environnement* (Directorate General for the Environment)
DGGT	*Direction Générale des Grands Travaux* (Directorate of Civil Engineering Work)
DPO	Development Policy Operation
DRC	Democratic Republic of Congo
GDP	Gross Domestic Product
GoC	Government of the Republic of Congo
GPRS	General Packet Radio Service
ICR	Implementation Completion and Results Report
ICT	Information and Communication Technology
ISR	Implementation Status and Results Report
IXP	Internet Exchange Point

M&E	Monitoring and Evaluation
MoU	Memorandum of Understanding
MPTNTC	*Ministère des Postes, des Télécommunications et des Nouvelles Technologies de la Communication* (Ministry of Posts and Telecommunications in Charge of ICT)
MSMEs	Micro, Small, and Medium Enterprises
PAD	Project Appraisal Document
PCN	*Projet de Couverture Nationale* (National Coverage Project)
PCU	Project Coordination Unit
PIU	Project Implementation Unit
PPP	Public-Private Partnership
PUITS	*Programme Universitaire d'Innovation en Technologies et Services*
RAP	Resettlement Action Plan
RoC	Republic of Congo
SPV	Special Purpose Vehicle
UMNG	*Université Marien Ngouabi*
VoIP	Voice over Internet Protocol
WACS	West Africa Cable System
WLL	Wireless Local Loop

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P122398	AFCRI-Central African Backbone - APL3 - Republic of Congo
Country	**Financing Instrument**
Africa	Investment Project Financing
Original EA Category	**Revised EA Category**
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
Ministry of Posts and Telecommunications in Charge of ICT, Ministry of Teleommunications	Ministry of Posts and Telecommunications in Charge of ICT, CAB Project Implementation Uniit

Project Development Objective (PDO)

Original PDO

The development objective of the proposed project is consistent with the PDO for the CAB Program: to contribute to increase geographical reach and usage of regional broadband network services and reduce their prices, in the Republic of Congo.

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
IDA-49740	15,000,000	15,000,000	13,513,558
IDA-59910	5,000,000	5,000,000	5,165,473
Total	**20,000,000**	**20,000,000**	**18,679,031**
Non-World Bank Financing			
Borrower/Recipient	15,000,000	15,000,000	15,000,000
Total	**15,000,000**	**15,000,000**	**15,000,000**
Total Project Cost	**35,000,000**	**35,000,000**	**33,679,031**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
25-May-2011	19-Dec-2011	27-Oct-2014	31-Dec-2016	28-Feb-2019

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
17-Mar-2015	6.04	Change in Results Framework Change in Components and Cost Reallocation between Disbursement Categories
29-Nov-2016	12.65	Change in Loan Closing Date(s)
30-Mar-2017	13.11	Additional Financing Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Disbursements Arrangements
06-Nov-2018	16.59	Change in Results Framework Change in Components and Cost Reallocation between Disbursement Categories
21-Mar-2019	18.67	Change in Loan Closing Date(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Moderately Unsatisfactory	Moderately Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	21-Sep-2011	Satisfactory	Satisfactory	.47
02	03-Dec-2011	Satisfactory	Satisfactory	.57
03	30-Jun-2012	Moderately Satisfactory	Satisfactory	1.49
04	23-Feb-2013	Satisfactory	Satisfactory	1.98
05	18-Jun-2013	Satisfactory	Satisfactory	2.50

06	12-Mar-2014	Satisfactory	Satisfactory	3.20
07	15-Nov-2014	Satisfactory	Satisfactory	4.34
08	20-May-2015	Satisfactory	Satisfactory	6.16
09	11-Dec-2015	Moderately Satisfactory	Moderately Satisfactory	8.55
10	26-Jun-2016	Moderately Satisfactory	Satisfactory	11.32
11	20-Jan-2017	Satisfactory	Satisfactory	12.84
12	29-Nov-2017	Satisfactory	Satisfactory	13.28
13	28-Jun-2018	Satisfactory	Satisfactory	16.47
14	09-Feb-2019	Moderately Satisfactory	Moderately Satisfactory	18.67

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Information and Communications Technologies	**100**
Public Administration - Information and Communications Technologies	16
ICT Infrastructure	84

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)

Private Sector Development	**80**
Business Enabling Environment	21
Investment and Business Climate	3
Regulation and Competition Policy	10
Innovation and Technology Policy	8
Jobs	15
Job Creation	15
Public Private Partnerships	10
Regional Integration	34

Urban and Rural Development	**30**
Urban Development	15
Urban Infrastructure and Service Delivery	15
Rural Development	15
Rural Infrastructure and service delivery	15

ADM STAFF

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Country Context

1. The Republic of Congo (RoC) experienced remarkable growth and progress toward economic reform over the decade preceding this project. The RoC made significant progress toward economic stabilization and "first generation" structural reforms since the end of civil strife in 2000. With considerable resources (oil, forests, arable land, minerals), a small yet highly urbanized population (63 percent of 4.3 million)[1] and access to a deep-sea port at Pointe-Noire, this Central African nation had the opportunity to leverage its strategic advantages to build a growing economy and attain a higher standard of living for its people. Gross domestic product (GDP) growth had stabilized, gross national income per capita increased significantly, and inflation remained broadly under control. Thanks to a near doubling of GDP at constant prices from 2002 (US$735 million) to 2008 (US$1,425 million), the RoC surpassed the threshold for lower-middle-income countries.

2. The country struggled with economic diversification, as the RoC's economy remained relatively dependent on oil. Extensive state intervention in the economy during the 1970s and 1980s had severely hampered economic growth, while recurrent conflicts in the 1990s ravaged the country's infrastructure and public institutions. A decrease in oil production caused by an oil platform accident in 2007 resulted in the country's GDP contracting by 1.6 percent in real terms, illustrating the vulnerability of the economy to changes in oil production and prices. Although oil production recovered strongly in 2008, this was partially offset by the global financial crisis in the second part of the year. Real GDP was projected to have expanded by 9.1 percent in 2010 compared to 5.6 percent and 7.5 percent in 2008 and 2009, respectively, due to continued high growth in the oil sector (14.7 percent in 2010 versus 16.2 percent in 2009) as well as an acceleration of the growth rate of the non-oil sector (6.5 percent in 2010 versus 3.9 percent in 2009). Although oil dominated the RoC's economy, there was considerable strategic interest in stimulating the development of key sectors such as information and communication technology (ICT) as part of a long-term economic diversification effort that could make a significant contribution to growth while improving the investment climate in the RoC.

Sector Context and the Central African Backbone Program

3. In 2009, despite reforms implemented in the telecommunications sector, Central African countries were still suffering from limited access and high costs of 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. These constraints impinged on the countries' abilities to trade with others, create new jobs, and expand their production of goods and

[1] United Nations World Population Division, 2010.

services. 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.

4. 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 therefore to advance their growth agenda and overall global competitiveness. Landlocked countries in Central Africa could be especially disadvantaged as they need to interconnect with incumbents or national long-distance operators in intermediary countries to carry traffic to a submarine cable landing point and often would pay high prices in the process.

5. The Central African Backbone (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 network. The objective of the CAB Program is to contribute to increase the geographical reach and usage of regional broadband network services and reduce their prices. The CAB Program includes four components. The first aims to improve the enabling environment and (a) promote further regional market integration; (b) strengthen the legal, regulatory, and institutional framework; (c) support market liberalization; and (d) promote the establishment of infrastructure that once in place is accessible to all service providers on open, transparent, competitive, and nondiscriminatory terms. The second aims to increase connectivity: leveraging existing fiber optic networks and supporting the deployment of interconnected networks to form a regional network. The third component focuses on ICT sector development, including eGovernment and flagship ICT applications, making use of the improved connectivity. Finally, the fourth component is the project management.

6. In May 2007, the heads of state of the Central African Economic and Monetary Community (*Communauté Economique et Monétaire des Etats de l'Afrique Centrale*, CEMAC) adopted a declaration calling for the establishment of the CAB under Open Access and public-private partnership (PPP) principles and asked for financial assistance from donors. Five CAB projects have since been launched in Chad, Cameroon, Central African Republic (CAR), Democratic Republic of Congo (DRC), Gabon, the RoC, and São Tomé and Principe.

7. The World Bank was well placed to contribute in the context of a multiple development partners' effort: the World Bank Group has been involved in the CAB Program since its inception. The 2007 Declaration of the CEMAC heads of state called explicitly for World Bank Group financial support for the implementation of the CAB Program. The overall program was formulated with other key stakeholders and development financial institutes: the African Development Bank (AfDB) joined the initiative in 2007 and has provided parallel financing for the CAB Program; the African Union is also playing an important role in facilitating intergovernmental cooperation and policy harmonization, in conjunction with CEMAC.

8. The project in the RoC was initiated at the Government's request, to allow neighboring countries to become connected to the West Africa Cable System (WACS) landing station near Pointe-Noire, the only landing station through which the CAB program could be connected, and to provide backup routes for

other African cable systems, including SAT3 and Africa Coast to Europe (ACE). The project planned for Cameroon, CAR, and Gabon to be connected through the RoC.

9. Since 1997, the Government of the Republic of Congo (GoC) had initiated an era of liberalization and succeeded in attracting private mobile telecommunications operators, after passing a law abolishing the monopoly of the *Office National des Postes et Télécommunications*. Three main existing operators (Zain Bharti Airtel, MTN Congo, and Warid Telecom) entered the market in the decade that followed, and a fourth in 2010. However, the October 29, 2004 - Decree No. 466 restored monopoly powers on the international gateway and gave wireless local loop (WLL) market exclusivity to Congo Telecom, jeopardizing telecom sector performance. In 2009, the triggers for the completion point under the Heavily Indebted Poor Country (HIPC) Initiative included repealing the decree and establishing an independent telecommunications regulatory authority. By August 28, 2009, both Chambers of the Parliament had adopted a complete Postal and Telecom legal and regulatory framework.

10. In 2008–2009, the GoC designed and adopted a new Policy and Strategic Vision for the ICT sector (Cyberstrategy), a road map ushering the RoC to the next stage of ICT connectivity, with the goal of becoming a regional ICT hub. The Cyberstrategy also promoted the ICT sector as an opportunity for non-oil diversification and an engine of job creation. The Cyberstrategy contains four pillars: (1) Infrastructure and Universal Access, (2) Legal and Institutional Framework, (3) Human Resources, Promotion of ICT and Innovation, and (4) ICT Products and Services. The GoC developed an action plan to implement this strategy; of 27 projects, 17 are within the ICT sector, and 10 are related to Postal Services. At the time of appraisal, the action plan's implementation had made little progress however. Three noteworthy actions included the creation of a Regulatory Agency for Post and Electronic Communications (*Agence de Régulation des Postes et des Communications Electronique*, ARPCE) in 2009 and the initiation of two major infrastructure projects supervised by the Directorate of Civil Engineering Work (*Direction Générale des Grands Travaux*, DGGT).

11. Most of the telecommunications network, including the national microwave transmission backbone, had been destroyed during the war. All but one telephone exchange at Pointe-Noire were damaged. Since then, Congo Telecom had undertaken a limited infrastructure rehabilitation program. Most of the backbone uses wireless connections through 32 Mbps microwave links. The two national infrastructure projects aimed to catalyze the country's transition into a regional hub for ICT: the WACS and the National Coverage Project (*Projet de Couverture Nationale,* PCN). The WACS is a submarine communications cable linking South Africa with the United Kingdom along the west coast of Africa. The cable landed in Matombi near Pointe-Noire and connected the RoC to the global submarine cable network. The design capacity of the WACS is at least 3.84 Tbps. The GoC planned to finance the PCN to provide a transmission capacity network between the landing station in Pointe-Noire, Brazzaville, and Ouesso. The PCN and the WACS connectivity were key building blocks to help position the RoC as a traffic hub in between Gabon, Cameroon, CAR, Angola, and DRC.

12. Increased competition in the mobile market had led to relatively widespread mobile coverage in the country. In the fourth quarter of 2010, the 2G penetration rate was more than 85 percent (source: GSMA). While mobile phone users with multiple SIM cards somewhat inflate subscriptions rates,

increasing competition in the mobile market accelerated the industry's extensive coverage and growth. Services were widely available in the cities of Brazzaville, Pointe-Noire, Dolisiee, Nkayi, Kinkala, Mouyondzi, Gamboma, and Ouesso. Coverage to areas outside of major population centers was improving, although it remained lower than in urban centers. At the end of 2010, the four key mobile operators were Zain (Bharti Airtel - 1.598 million users), MTN Congo (1.666 million users), Warid Telecom (0.500 million users), and Azur (0.120 million users).

13. Mobile broadband access was nonetheless low. At the end of 2009, there were only 15,000 internet subscribers in the country, the bulk of which connected via General Packet Radio Service (GPRS) networks (source: ARPCE). RoC's eGovernment Readiness Index had fallen from 0.2855 in 2005 to 0.2737 in 2008. Operators themselves offered limited services: the incumbent operator appeared to have reentered the internet sector recently, offering Internet Protocol TV (IPTV) and Voice over Internet Protocol (VoIP) services in addition to its Asymmetric Digital Subscriber Line (ADSL)-based broadband connections (although speeds are limited to 256 kbps for residential users). Other operators had alternative sources of internet access: mobile operator Airtel Congo had WLL networks or dial-up via mobile handsets in Brazzaville and Pointe-Noire; MTN Congo used GPRS-based mobile internet services; and fixed line operator Alink Telecom offered data, internet, and VoIP services via its WLL and satellite network. The 2009 ICT Development Index ranked the RoC 132 out of 159 in the world and 15 out of 37 in Africa.

Theory of Change (Results Chain)

14. The CAB Program was designed to help increase geographical reach and usage of regional broadband network services and reduce their prices in the RoC by focusing on investments linked to fostering open and cost-effective access to communications infrastructure. At appraisal, the theory of change was not a requirement of the Project Appraisal Document (PAD); the theory of change (see table 1) has been created for the purposes of this Implementation Completion and Results Report (ICR) and includes the following assumptions:

(a) The GoC supported the establishment of PPP as a part of this project.

(b) Government investment in the sector would encourage further openness and competition.

Table 1. Theory of Change

Components	Activities	Outcomes	PDO
1. Enabling environment: improvement of policies and regulatory framework	• Strengthening the telecommunications policy, legal, and regulatory framework • Building the regulatory capacity of ARPCE and supporting its strategic development • Promoting an Open Access and wholesale pricing regime to promote PPP schemes and establish a Special	Opening up of the telecommunications market to competition	Contribute to increase geographical reach and usage of regional broadband network services and

Components	Activities	Outcomes	PDO
	Purpose Vehicle (SPV) for the ICT infrastructure network • Developing a strategic plan for Congo Telecom • Implementing a management policy for the .cg domain name		reduce their prices in the RoC
2. Connectivity: supporting the development of the RoC's telecommunication infrastructure and interconnection with neighboring countries	• Set up three inter-regional links through PPP arrangements to Gabon, Cameroon and DRC • Establish Internet eXchange Point(s) (IXPs)	Reduced cost of and improved access to broadband services	
3. Promotion of ICT sector: supporting the development of e- and m- services and applications	• Strengthen ICT ('cyber') legal and institutional framework • Set up an ICT business incubator • Study for the design and development of an interoperable platform for digital application development	Improved efficiency of transactions processed and improved user perception of services	

Project Development Outcomes

15. The Project Development Objective (PDO), as stated in the PAD and the Financial Agreement was "to contribute to increase geographical reach and usage of regional broadband network services and reduce their prices, in the Republic of Congo." This PDO is consistent with the PDO for the CAB Program.

Key Expected Outcomes and Outcome Indicators

16. The PDO contains three separate development objectives:[2]

- PDO 1: To contribute to increase the geographical reach of regional broadband network services
- PDO 2: To contribute to reduce the prices of regional broadband network services
- PDO 3: To contribute to increase the usage of regional broadband network services[3]

[2] These sub-PDOs are consistent with the ICR report for the Central African Backbone Program (APL1A) (Report No. ICR00003827).
[3] The order of sub-PDOs 2 and 3 have been reversed from their order in the full PDO because price reduction (that is, affordability) generally drives increased usage of broadband services.

17. Achievement of the development objectives was assessed through four outcome indicators, that are consistent across CAB projects. The key monitoring indicators are summarized in table 2.

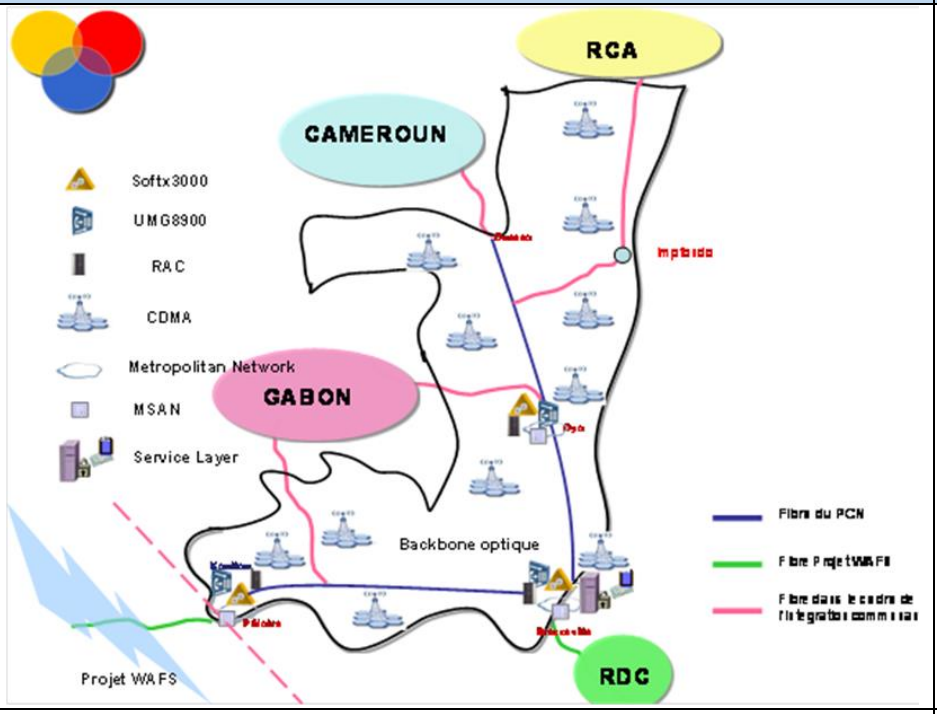
Table 2. PDO Indicators for CAB3 Congo

Outcome Indicators for CAB3 Congo [same indicators as for CAB Program]
• International communications (Internet, telecoms, and data) bandwidth per person *(PDO 1)* • Internet subscribers per 100 inhabitants *(PDO 3)* • Average monthly price of international capacity link (E1 or 2 Mbps) from the capital city to Europe *(PDO 2)* • Number of direct project beneficiaries (% female) *(PDO 3)*

Components

18. The project was originally composed of four main components to achieve the PDO with total financing of US$30 million, including US$15 million from the World Bank and a US$15 million contribution from the GoC.

Original Component (2011, total US$30 million)	**IDA (US$ and % of total)**
1. Enabling Environment Provision of legal and regulatory technical assistance to (a) Strengthen the regulatory framework and policy and regulatory capacity to the Ministry of Posts and Telecommunications in Charge of ICT (*Ministère des Postes, des Télécommunications et des Nouvelles Technologies de la Communication,* MPTNTC) and ARPCE; (b) Promote an Open Access and wholesale pricing regime; promote PPP schemes in the telecom ICT sector; and establish an SPV to build, manage, and operate access to the ICT infrastructure network financed under the project; (c) Design a strategic plan for Congo Telecom and propose options for business valuation to help the incumbent operator review and refine existing product and service portfolios; and (d) Design and implementing a management policy for ".cg" domain name.	US$3.55 million (23.7%)
2. Connectivity (a) Carrying out of environmental and resettlements consultancies (b) Financing of fiber optic cables, terminal equipment, and switches to set up, through PPP arrangements with private sector participation, three interregional links to the neighboring countries of Gabon (through the link Dolisie - Mbinda), Cameroon (through the link Oyo - Ouesso), and DRC (through the link Brazzaville - Kinshasa) (c) Establishing of one or more IXPs to minimize rerouting of domestic internet traffic via international routes	US$9 million (60%)

Original Component (2011, total US$30 million)	IDA (US$ and % of total)
	
3. Promotion of ICT sector (a) Technical assistance for the review, improvement, and development of information laws, 'cyber' legal, and institutional framework, including with respect to cybersecurity, cybercrimes, privacy, promotion of the ICT sector, and support to the national entities in charge of ICT (b) Promotion of ICT start-up firms through a business incubator approach (c) Carrying out of a study for the design and development of an interoperable platform for m- and e-applications development	US$1 million (6.7%)
4. Project Management Support for the establishment of an effective management system for suitable financial management, procurement, and monitoring and evaluation and the availability of the required communications expertise.	US$1 million (6.7%)

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION

19. The project underwent five restructurings and an Additional Financing (AF), as detailed here. Explanations for these changes are further detailed in the subsequent 'Rationale for Changes' section.

- #1 - Level 2 restructuring, March 17, 2015 [Report No. RES16819]. The restructuring followed the midterm review that took place in October 2014 and included two main changes that reflected infrastructure developments in neighboring countries, updated cost estimates, and took into account changes in the sector:

(a) The scope of Components 1, 2, and 3 was revised and a number of activities were dropped. The project would no longer finance technical assistance for the restructuring of Congo Telecom (Component 1), the regional link with Cameroon or DRC (Component 2), nor the establishment of m- and e- platforms and a business incubator (Component 3).

(b) Funds from Components 1 and 3 were reallocated to Component 2 to cover the total cost of the construction contract (Pointe-Noire - Mbinda) and to Component 4 to cover the operating costs of the Project Coordination Unit (PCU).

- #2 - Level 2 restructuring, November 29, 2016 [Report No. RES25677]. The project was due to close on December 31, 2016. This restructuring extended the credit closing date by 18 months to June 2018 to facilitate the transition to the AF that was under preparation (see below).

- #3 - AF [Credit No. 4974-CG] and Level 2 restructuring, March 30, 2017, [Report No. RES25677] to scale activities in Component 3 and address equipment and construction cost overrun issues in Component 2. This third restructuring made the following major changes:

  (a) An AF of US$5 million (XAF 3.7 million) for Component 2 costs that could not be covered by the counterpart funding as intended and the addition of new activities to promote the ICT sector through the establishment of a Digital Development Fund in Component 3

  (b) Extension of the credit closing date to December 31, 2019

  (c) Adjustment of outcome targets for the new closing date

- #4 - Level 2 restructuring, November 6, 2018 [Report No. RES32517] following the quasi-full disbursement of the project. This restructuring included

  (a) Reallocation of the AF funds under Component 3 and savings from Component 4 to Component 2 to cover a financing gap due to GoC's budget constraints; and

  (b) Cancellation of Component 3 activities (added in the previous restructuring).

- #5 - Level 2 restructuring, February 28, 2019 [Report No. RES36150]. The closing dates of the initial financing and AF were moved forward to February 28, 2019, following the completion of all activities per the previous restructuring and full disbursement. Target dates for indicators were not updated.

Revised PDOs and Outcome Targets

20. The PDO was not revised.

21. The outcome targets were revised in restructuring #3 when the credit closing date was extended to December 31, 2019. These PDO indicator targets were then maintained throughout the project, including in restructuring #5 when the closing date was brought forward.

Table 3. PDO Indicators and Targets

PDO Indicator	Unit	Baseline December 2010	Original Target June 2016	Target at Closure[a] February 2019
Volume of international traffic-International internet bandwidth	bits per second person	**51**[b]	500	3,341
Access to Internet Services	number of subscribers per 100 people	**6.10**	15.00	40.00
Direct project beneficiaries	Number	**50,000**	80,000	1,732,051
Average monthly price of wholesale international E1 capacity link from capital city to Europe	US$	**3,200**	800	892
Female beneficiaries	%	**50**[c]	50	37

Notes:
a. For the purpose of this ICR, the target date is taken to be the closing date.
b. Baseline date: December 31, 2009.
c. This baseline reflected an assumption at the time of appraisal.

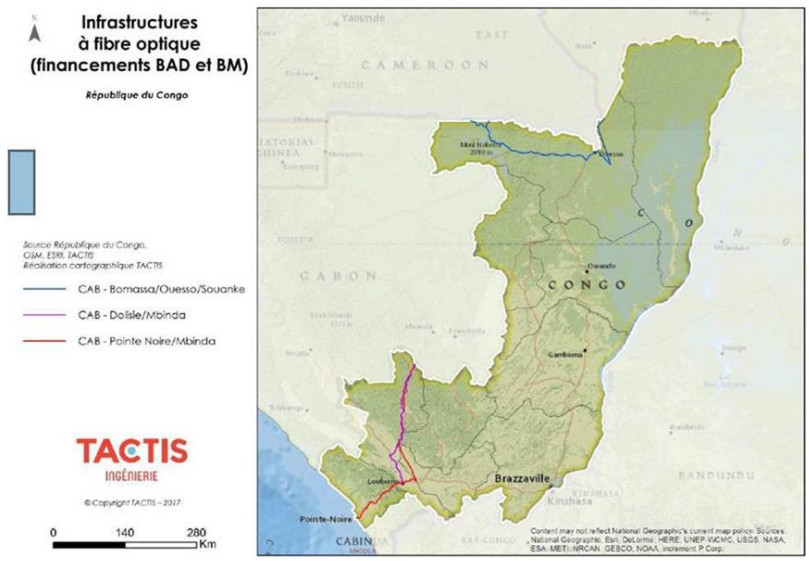
Revised PDO Indicators

22. No PDO indicators were changed or removed. Several additions were made to intermediate indicators following restructuring #1 and again after restructuring #2 to account for the new activities planned under Component 3; all were subsequently removed from the Results Framework following restructuring #3.

Revised Components

23. All components and funding allocations were revised during the project through the restructurings and AF, as summarized in table 4.

Table 4. Revised Components

Component Changes at Closure (compared to components at appraisal)	Original Credit at Closure (US$ and % of total)	Additional Financing at Closure (US$ and % of total)	Total
1. Enabling Environment Activities related to the operational audit and restructuring of incumbent operator Congo Telecom were dropped.	US$3.55 million (23.7%)	US$0 million (0%)	US$3.55 million (17.75%)
2. Connectivity The project financed only one link of the three initially planned: the connection between the RoC and Gabon. This link was extended from 338 km to 520 km to go along the railway lines and to connect directly with the WACS landing station near Pointe-Noire (indicated by the red and pink lines in the map below). 	US$9 million (60%)	US$3.4 million (68%)	US$12.4 million (62%)
3. Promotion of ICT sector E-government and the establishment of a data center needed for the development of digital applications (m- and e-) exceeded the budget and were consequently dropped. Connectivity was provided for the national university, as well as the setup of a digital lab. Financing for a local incubator and the establishment of a Digital Development Fund (DDF) were added during in the AF, but were dropped following restructuring #3 whereby funds had to be reallocated to fill gaps in Component 2.	US$1 million (6.7%)	US$1.1 million (22%)	US$2.2 million (11%)
4. Project Management: Funding reallocations to account for component changes, additional financing, and extension of the closing of the project.	US$1 million (6.7%)	US$0.5 million (10%)	US$1.5 million (7.5%)

Rationale for Changes and Their Implication on the Original Theory of Change

24. The restructurings and AF did not change the theory of change and the PDO.

25. The first restructuring took place following the Mid-Term Review. The reallocation of funds and changes made to components took place as a result of the following factors:

(a) **Macroeconomic changes:** The variation in exchange rate between the U.S. dollar and C.F.A. franc resulted in a net loss of 7 percent of the project total cost. Estimates in the PAD were based on an exchange rate of XAF 500 for US$1. However, the U.S. dollar dropped to XAF 470 during implementation and the variation.

(b) **Increases in costs compared to estimates at appraisal:** Under the initial financing, studies showed costs of equipment for e-government and the establishment of a data center needed for the development of digital applications (m- and e-) exceeded the budget and were consequently dropped. In addition, construction costs had increased since the original estimates calculated during appraisal. This informed the reallocation of funds from Components 1 and 3 to Component 2. Component 2—the construction of the national backbone infrastructure—was prioritized over Component 3 given its centrality to the project objectives and the essence of the CAB regional program.

(c) **Change in status of telecom infrastructure development in neighboring countries:** On the Cameroon side, the preparation and negotiation phases of the AfDB-funded "Central Africa Backbone (CAB) Project Congo Component" project were delayed and no fiber optic infrastructure would reach the border before the CAB project closing date. The AfDB has since approved a project in 2016 to build this link, drawing on the studies done for the WB project.[4] The same happened in CAR where the AfDB funded project finally came on board after the Central African Backbone 1a was closed (P108368 - AFR: Central African Backbone - APL1A). In the South, the Government utilized its own funds for the fiber optic link between Brazzaville and Kinshasa, which was inaugurated in December 2013. A technical assistance was mobilized through the PPIAF fund to facilitate the interconnection following the preparation, the negotiation and signature of a memorandum of understanding (MoU) between the two parties. The project was restructured to reduce the scope of Component 2 and finance only the link to Gabon (to Mbinda). Though the links to DRC and Cameroon were no longer to be financed by the WB, this CAB project contributed significantly to their realization: the studies and preparation done for this project informed and catalysed their establishment not only at the national level but at the regional level through the AfDB project.

[4] African Development Bank. 2016. *Central Africa Backbone (CAB) Project Congo Component*. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Boards-Documents/Congo-_Central_Africa_Backbone__CAB__Project_-_Congo_Component.pdf.

(d) **Sectoral developments:** The influencing power of the incumbent operator was considerable; as such, attempts to reform Congo Telecom were unsuccessful and related activities dropped as a result. The director of Congo Telecom is an adviser to the President, as well as coordinator of the PCN.

26. The rationale for the AF and the third restructuring was twofold:

(a) **To close the financing gap for the construction and equipment contract following cost overrun and the unavailability of counterpart funding.** The project had initially underestimated the construction costs (change of route and increasing civil works costs) and the contract had to be split into two parts: Part 1 of the contract, fully funded by the CAB3, financed the passive infrastructure (construction and fiber optic) and Part 2 ("conditional part" for around XAF 4.2 billion) finances active equipment (shelters and electronic/communication equipment). Following a severe drop in oil prices, the Government faced increasing budget constraints and was unable to fulfil its initial financial commitment to the CAB Project. Restructuring #3 was requested also to reallocate funds from Component 3 and 4 to Component 2 to fill the financing gap.

(b) **To scale up the activities of Component 3 on the promotion of ICT in the RoC.** To encourage ICT innovation and entrepreneurship, the project will seek to tackle two constraints: access to finance for innovators and entrepreneurs, and lack of supportive incubation services. The DDF and incubator will seek to achieve two objectives respectively: (i) leverage private funding through creative financing tools (direct cash or in-kind private sector contribution, equity participation, project bonds, and so on) and enable access to finance for micro, small, and medium enterprises (MSMEs) in the ICT sector in the RoC through the DDF and (ii) stimulate job creation and facilitate economic diversification through the incubator.

27. The fourth restructuring took place to address the worsening budget constraints faced by the GoC, which could not cover the financing gap that remained for Component 2. The delay in paying the manufacturer's debts and audit of the network risked having an adverse impact on the integrity of the network built so far and eventually to delay its operationalization with a very substantial risk to strand the investment already made. Consequently, funds were reallocated from Component 3, and the activities added in the third restructuring were cancelled.

28. By end-2018, full disbursement had been achieved ahead of the official closing date and all key components and activities, disbursement, and fiduciary measures for the closure of the project were completed. The intent had been to change the closing date during the third restructuring, and the official closing ceremony was held in December 2018. However, this was delayed as the Government request to advance the closing had not been received, and an additional fifth restructuring was needed for administrative reasons. It should be noted that the Results Framework was not updated to reflect the earlier closing date.

29. While the results chain remained sound, activities cancelled in the restructurings may have limited achievement of some of the outcomes, as further discussed in the Outcome section.

II. OUTCOME

A. RELEVANCE OF PDOS

Assessment of Relevance of PDOs and Rating

30. The ICR assesses the relevance of the PDOs as High. This rating is applied for the entirety of the project as the primary objectives to contribute to increase geographical reach and usage of regional broadband network services and reduce their prices in the RoC were maintained and remain a critical component of Government and World Bank development strategies in the RoC.

31. The PDO was well aligned with the GoC's Cyberstrategy. It supported 3 of the 17 ICT-related projects (labeled P1 to P17 of the Cyberstrategy): P1 - Implementation of a broadband national network, P3 - Development of ICT legal framework, and P5 - Capacity development of ARPCE. It also contributed to P12 - Creation of IT Micro, Small and Medium Enterprises (MSMEs) incubators. The project components were similarly aligned to the Cyberstrategy: Component 1 contributed to P3 and P5, Component 2 to P1, and Component 3 to P3 and P12. These components remained relevant to these objectives throughout the project, even though certain activities were removed during restructurings.

32. The project was consistent with both the Country Partnership Strategy (CPS) FY10–12 [Report No. 48404] and the subsequent CPS FY13–16 [Report No. 71713]. At the time of closing, no new CPS had been published. The project contributed to three of the CPS FY10–12 seven outcomes by financing a regional telecommunications infrastructure to enhance the RoC's transit role in the region (outcome (vi) - a foundation for increasing the RoC's market share in regional transit services) and extend the usage/reduce prices of broadband network services (outcome (v) - improved infrastructure service delivery). The project's Component 3 aims to extend opportunities in the local ICT industry (outcome (iv) - a foundation for MSME growth). The project was also aligned with the ongoing CPS (FY13–FY16), specifically contributing to Outcome 1.3: Improved Regional Telecommunications under the Competitiveness and Employment pillar.

33. The project contributed to regionalization and the overall goals of the CAB Program, and the CAB Program fit well with World Bank Group's Regional Integration Assistance Strategy for Africa (RIAS), particularly within the framework of the Africa Action Plan. The project was also designed to contribute to the implementation of both the Africa Strategy and the updated continent-wide RIAS that were discussed by the Board in 2004. The RIAS placed significant emphasis on the need for improved regional physical connectivity, including ICT infrastructure, as critical foundation for effective regional integration and the competitiveness of African economies. The project supported the objective of CEMAC and ECCAS (Economic Community of Central African States) of creating an integrated and competitive economic space in Central Africa. In particular, it contributed to the implementation of the third pillar of the 2010–2015 CEMAC Regional Economic Program related to physical interconnectivity of its member countries.

34. The project was aligned with the GoC's goals of improving regional integration and increasingly positioning the country as a service hub for neighboring countries and the region. Improved communications capacity, better information access, and affordable international communications were designed to help the RoC regain its historical position as a thoroughfare, albeit now through ICT infrastructure and services, connecting the Point-Noire - Brazzaville corridor within the RoC and neighboring Gabon. Discussions with government stakeholders at project closing emphasized this continues to be a priority for the GoC. The project aimed to provide an additional route to submarine cable connectivity, thereby leading to additional price and quality pressure on the regional high speed internet traffic across the region. Government commitment to continuing to develop its regional telecom infrastructure and digital economy are illustrated in the AfDB CAB project that followed in 2016.

B. ACHIEVEMENT OF PDOS (EFFICACY)

Assessment of Achievement of Objectives / Outcomes

35. As outlined above, the PDO contains three separate development objectives:

- PDO 1: To contribute to increase the geographical reach of regional broadband network services
- PDO 2: To contribute to reduce the prices of regional broadband network services
- PDO 3: To contribute to increase the usage of regional broadband network services

36. The efficacy of the project has been assessed before each restructuring, the AF and at closure by measuring its implementation in terms of (a) compliance with the commitments contained in the financing agreements, (b) level of implementation of the activities of the various components, and (c) level of achievement of indicator targets.

37. The ICR assesses the achievement of the PDOs as Modest. The rationale for the assessment is further outlined below.

PDO 1: To contribute to increase the geographical reach of regional broadband network services

38. Achievement of PDO 1 is rated as Modest.

39. Project-financed technical assistance and the project's overall support to the governance of the ICT sector in the RoC contributed to the increases in geographical reach of broadband services. The PDO indicator on volume of international traffic was achieved at 470 percent . Coverage of the mobile network target was achieved at 100 percent. The number of localities with access to broadband was achieved by 96 percent, and is likely to be achieved by December 2019, the original closing date following the AF. At closing, the regional infrastructure, though successfully built, was yet to be commercialized. Despite the interconnection between Gabon and the RoC being operational, no traffic is exchanged between the two

countries, and no Open Access regime or PPP were established. Achievement of the target indicators is indicated in table 5.

Table 5. Achievement of PDO 1 Target Indicators

Indicator	Unit	Baseline (December 2010)	Target at Appraisal (June 2016)	Target at Closing (February 2018)	Value at Closing (December 2019)
Volume of international traffic-International internet bandwidth (bits per second person)	Number	51	500	3,341	15,500
Coverage of mobile network	Percentage of population covered	89	95	97	97
Localities with broadband internet access - 128 kbps	Number	4	10	50	43

40. The main project outputs relevant to this outcome include the following:

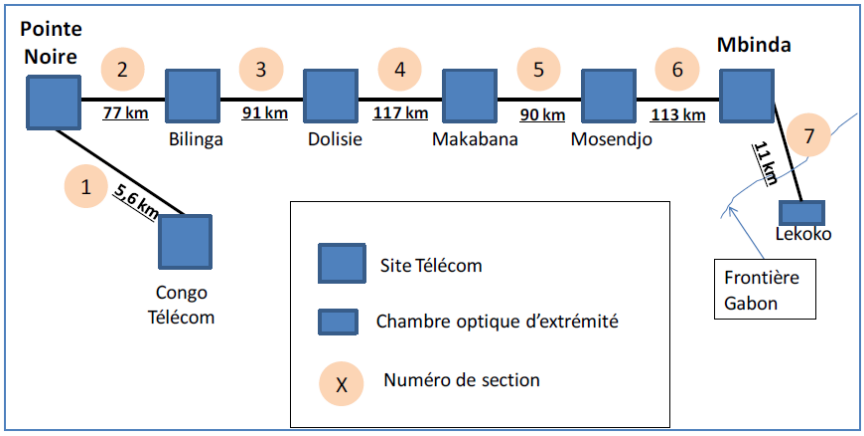
(a) **Technical assistance and policy dialogue** to strengthen the legal and regulatory framework, including: a broadband strategy, delivered in 2013 and adopted by GoC; a study of homologation of equipment, which was implemented; a study on portability, also implemented. Additionally, a wholesale observatory was put in place in 2013 and continues to monitor the telecom industry and produce quarterly market reports.

(b) **Frequency management plan for ARPCE.** Frequency allocation for spectrum is a necessary condition for 3G, 4G, and more generally international broadband access and ICT sector development. The frequency management plan was adopted by the ARPCE and is currently utilized in the RoC.

(c) **The construction of national backbone infrastructure.** The construction of 505 km fiber optic network connecting the RoC and Gabon was completed in 2018. Two inauguration ceremonies were held, the first in the RoC on December 22, 2017, and the second in Gabon on February 24, 2018,[5] with the Ministers of ICT from both countries present.[6]

[5] *Agence nationale des infrastructures numériques et des fréquences du Gabon* - ANINF, *Articulation de la cérémonie d'inauguration et de l'interconnexion Gabon-Congo*. https://www.facebook.com/aninf.ga/posts/2088755208009219.
[6] Digital Business Africa, "*Le Gabon et le Congo Brazza célèbrent leur interconnexion en fibre optique via le projet CAB*." April 8, 2018. https://www.digitalbusiness.africa/gabon-congo-brazza-celebrent-interconnexion-fibre-optique-via-projet-cab/.

Figure 1. Architecture of the Fiber Optic Network Built under the Project



Unfortunately, at project closing the network was yet to be commercialized, and the signature of the necessary policy agreement between the two national regulators has been postponed several times (only an MoU between the two sectorial ministries has been signed). In May 2018, a three-year contract was signed between the GoC and Skytic Telecom, a local telecommunications network operator, through its subsidiary ROFA to secure, maintain and market the network. This was proposed by GoC to keep the network in good condition and meet the various operating costs as a temporary solution. However, the firm has not secured nor maintained the network since the start of the contract, and consequently the infrastructure has suffered some deterioration. An independent technical audit confirmed its readiness in December 2018, pending a list of short-term remedial actions, which were undertaken in the months that followed. According to the GoC, no further steps were taken by Skytic to maintain the network thereafter. In February 2019, a second audit was conducted by the same firm, indicating several disruptions to the network remained. In July 2019, the GoC notified Skytic of termination of its contract for non-effectiveness, and published on July 26, 2019, Terms of Reference for a 7-year contract to manage, commercialize, exploit, and maintain the fiber optic network. As of October 22, 2019, the GoC was reviewing responses.[7] This is an encouraging step toward operationalizing the infrastructure, ensuring the use and sustainability of this strategic asset for the RoC, and achieving the projects development outcomes.

41. The establishment of a PPP to ensure an efficient and sustainable management of the infrastructure and the establishment of an Open Access regime are core pillars of the CAB regional program. Unfortunately, these did not materialize before project closing. In spite of significant efforts and several activities aimed at the establishment of a PPP, political economy and rapid turnover of key public stakeholders delayed or thwarted its creation. Activities included considerable sensitization efforts and policy dialogue, including recruitment of a PPP consultant and the contracting of a firm to design and

[7] "*Le Congo a initié la procédure de recrutement d'un opérateur pour gérer les infrastructures nationales de fibre optique.*" October 18, 2019. https://www.agenceecofin.com/gestion-publique/1810-70268-le-congo-a-initie-la-procedure-de-recrutement-d-un-operateur-pour-gerer-les-infrastructures-nationales-de-fibre-optique.

structure a PPP, a public service delegation contract for the management, marketing, operation, and maintenance of the CAB project's fiber optic network; the creation of the Inter-ministerial Committee in January 2017 for the recruitment of an international operator for the management, operation, maintenance, and marketing of the CAB project infrastructure under an Open Access regime; and guidelines for implementation of the PPP principles and open access to the network as part of the CAB4 Gabon project.

42. An international call for tenders was declared unsuccessful in 2016; it is likely that the political economy of the country discouraged major operators from participating. The project closing date was extended until December 31, 2019, to allow sufficient time for the establishment of an SPV—a *Société de Patrimoine National* (SPN)—and to launch a second PPP transaction. Taking into consideration local political economy constraints and to facilitate this second PPP transaction, the team proposed to include a telecom component in the RoC Development Policy Operation (DPO) Series that was under preparation at the time (Congo Fiscal management, economic and social resilience DPF 2018–2020, P165815). Two prior actions were under consideration: the creation of the SPN which would hold on behalf of the GoC the fiber optic infrastructure built as part of the CAB Project and a PPP Agreement, to be concluded between the SPN and a private operator (or group of operators) for the management, maintenance and marketing of the infrastructure built under the CAB Project. However, this DPO did not come to fruition.

PDO 2: To contribute to reduce the prices of regional broadband network services

43. Achievement of PDO 2 is rated as Modest.

44. Through project-financed technical assistance to the regulator, the project achieved some progress in contributing to reduce the price of broadband services. PDO indicator of average monthly price of wholesale international E1 capacity was achieved at 75 percent. The retail price of internet service did decrease significantly, and the target was 98 percent achieved during the project. Nonetheless, the regulatory approach only was not sufficient to reach the target. Achievement of the target indicators is indicated in table 6.

Table 6. Achievement of PDO 2 Target Indicators

Indicator	**Unit**	**Baseline** (December 2010)	**Target at Appraisal** (June 2016)	**Target at Closing** (February 2019)	**Value at Closing** (December 2018)
Average monthly price of wholesale international E1 capacity link from capital city to Europe	US$	3,200	800	892	1,465
Retail price of internet service (per 256 kbit/s per month)	US$	300	80	70	74
Average cost of mobile call (three minutes, local, peak)	US$	0.5	0.10	0.55	0.16

45. The main project outputs relevant to this outcome include the following:

(a) **Technical advice on taxation mechanisms for the ICT sector**, which resulted in the *Loi de finance sur la Fibre* that aimed to improve the price of internet access by adjusting taxes and fees.

(b) **Establishment of national IXPs and an interconnection framework for the Economic Community of Central African States** (*Communauté Économique des États de l'Afrique Centrale,* CEEAC) and CEMAC. The Congo Internet Exchange (CGIX) exchange point is functional and operational as of 2013. Two ISPs and two operators were connected, and the average bandwidth exchanged is 5 Mbps. CGIX has become the regional IXP for Central Africa. Additionally, training has been provided on Border Gateway Protocol routing. The CGIX contributed to lowering prices by avoiding the use of international capacity for domestic traffic.

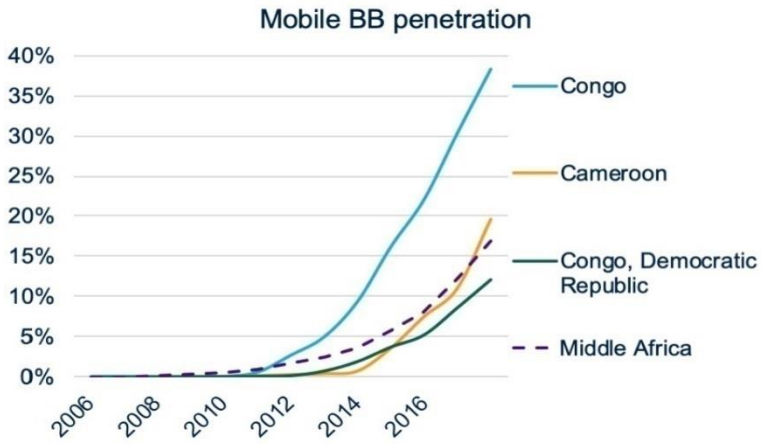
(c) **Construction of the regional network between the RoC and Gabon**. As was described above, this infrastructure was intended to increase international traffic and contribute to the achievement of this objective by increasing regional competition and thereby decreasing costs. Similarly, the Open Access regime was yet to be adopted, and would foster competition in the broadband wholesale market and lower prices also as a result.

PDO 3: To contribute to increase the usage of regional broadband network services

46. Achievement of PDO 3 is rated as Substantial.

47. Through the activities described above to improve access and reduce cost of internet and the activities conducted in Component 3 of the project, use of internet broadband services increased throughout the project and the digital ecosystem in the RoC was strengthened. The number of direct project beneficiaries, measured as the number of internet subscribers, far exceeded the targets set by the project, even after these were revised during restructuring. The indicator was achieved at 123 percent. Mobile broadband penetration and the number of internet subscribers per 100 people increased significantly, as can been in Figure 2.

Figure 2. Mobile Broadband Penetration (source: GSMA)



48. The targeted number of operators buying capacity from the regional infrastructure was not reached—once more as a result of the delay in commercialization of the regional network. Achievement of the target indicators is indicated in table 7.

Table 7. Achievement of PDO 3 Target Indicators

Indicator	**Unit**	**Baseline** (December 2010)	**Target at Appraisal** (June 2016)	**Target at Closing** (February 2019)	**Value at Closing** (December 2018)
Direct project beneficiaries	Number	50,000	80,000	1,732,051	2,119,873
Direct female beneficiaries	Percentage	50	50	37	35
Access to Internet Services	Number of subscribers per 100 people	6.1	15	40	42
Number of operators and service providers buying capacity from the regional infrastructure deployed	Percentage of population covered	0	5	3	0

49. Project outputs relevant to these outcomes include the following:

(a) **Frequency management plan for ARPCE.** As mentioned previously, this had a positive effect on the development of 3G and 4G penetration in the RoC, as seen in Figure 2. The two largest operators, MTN Congo and Airtel, both launched 3G in 2012.

(b) **Implementation of the management of the Congolese domain name ".cg".** The goal was to develop a local ecosystem and local content. According to ARPCE, 27 government websites

and over 630 local domain names have been created and are being used. These websites are therefore more visible than a .com domain, and users can access them more easily and with less latency.

(c) **The optical fiber interconnection of the institutes of the *Université Marien Ngouabi* (UMNG).** The project enabled the interconnection of 12 UMNG institutes in 2014, to enable access to the optical fiber connection and the connection of nearly 30,000 students, plus teaching and administrative staff. The university finalized its financial plan in 2019 and now provides internet access to its student body. The university launched *e-Scolarité* which allows students to register online as well as check the status of their payments and scholarships. The university also has an ambitious plan to develop online courses in the future.

(d) **Creation of the *Programme Universitaire d'Innovation en Technologies et Services* (PUITS) at the Université Marien Ngouabi.** Inaugurated on June 19, 2014, the PUITS is a digital center that aims to (i) support ICT projects, (ii) help young entrepreneurs with their business plans, and (iii) encourage exchanges between the university and the private sector. The building includes one classroom, a computer room, and a server room, which are used for masters' classes six days a week. In January 2018, the PUITS received over 900 applications for 30 available ICT trainings. The PUITS also serves as an incubator and hackathon space, through a partnership between ARPCE and the *Organisation Internationale de la Francophonie* (OIF). The center has to date held 18 seminars and 10 trainings and can accommodate courses for 35 graduate students. Over 500 students use the center each academic year.

(e) **Reinforcement of the legal and regulatory cybersecurity framework.** The following laws were adopted by Parliament:

(i) Loi relative à la Cybersécurité
(ii) Loi portant lutte contre la Cybercriminalité
(iii) Loi relative aux transactions électroniques
(iv) Loi portant création de l'Agence Nationale de Sécurité des Systèmes d' Information
(v) Loi portant Protection des données à caractère personnel

(f) **Development of the 2025 Digital Strategy (*Vision Congo Digital 2025*).** This strategy was developed in 2015 under the project, and published by decree 2019–150 on June 17, 2019, and contains three pillars: e-Citizen, e-Government, and e-Business.

C. EFFICIENCY

Assessment of Efficiency Rating

50. The overall efficiency is rated as Modest. The justification is provided below.

51. A 'take off' in volume of international traffic and 3G penetration can be seen in 2013 after the project was launched. Telegeography and GSMA data show a turning point in 2013 that is more pronounced than in neighboring countries. It is likely that the legal and regulatory technical assistance described above contributed to this. Mobile 3G penetration increased from 0 percent to 37 percent, higher than the average for the region (16 percent) and for Sub-Saharan Africa (33 percent). This trend is similar for 2G and 4G mobile penetration, though less pronounced. As technology develops, mobile services have the potential to impact economic development further through the provision of high-value 3G and 4G data services accessed via smartphones, tablets, and dongles that deliver mobile data services to businesses and consumers. According to a 2012 GSMA/Deloitte analysis of data on penetration in a panel of 96 developed and developing markets, a 10 percent substitution from 2G to 3G penetration increases GDP per capita growth by 0.15 percentage points. And according to World Bank research, each 10 percent increase in broadband penetration increases overall GDP growth in developing countries by 1.38 percent. While GDP grew in the years following implementation of the project, it decreased in 2016 and 2017, and it is difficult to attribute changes in GDP to the project.

52. The project saw a few cost overruns that affected the efficiency (as well as the implementation) of the project. The economic and financial analysis undertaken at the time of appraisal did not predict the changes in macroeconomic conditions that resulted in currency fluctuation and the increase in cost of construction in central Africa and resulted in reallocation of funds and cancellation of activities.

53. It was not possible to carry out a financial analysis for this ICR, as no business plan or financial model has been received for the operationalization of the network constructed by this project. It is anticipated, however, that once it becomes utilized the country will see lower prices and improved use of broadband services.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

54. The overall outcome rating for this project is Moderately Unsatisfactory. The project substantially achieved many of its objectives to provide increased access and use of broadband services. The project completed the construction of a strategic asset in challenging circumstances and continued to show signs of promise that the network would be operationalized throughout implementation—explaining the Satisfactory ratings in the Implementation Status and Results Reports (ISRs). Nonetheless, by closing, it was not able to implement the Open Access regime and PPP principles of the CAB Program, fell short of targets for the reduction of prices of broadband services, and is yet to see commercialization of the national backbone and the economic and financial benefits of the regional infrastructure financed through the project.

E. OTHER OUTCOMES AND IMPACTS

Gender

55. The PAD and Technical Annex did not include discussion about the gender dimension of ICT and broadband services in the RoC nor did the documents define gender-specific objectives, with one exception: the Results Framework included a gender baseline and target for the PDO indicator *Direct project beneficiaries* of 50 percent. This was revised in restructuring #2 to a target of 37 percent. The last ISR, dated December 2018, reported that an estimated 35 percent of beneficiaries at that stage were female, signaling that despite slow progress there is a positive trend. Facebook's Audience Insights data are aligned with this statistic, with 38 percent of users self-reporting to be women.[8] Given the gender inequalities in the RoC, such as women's economic and political participation, the project could have paid more attention to reducing the gender gap in access and use of broadband services.

Institutional Strengthening

56. Through Components 1 and 2, the project resulted in institutional strengthening of the ICT Ministry as well as the Regulator: *Direction Générale du Développement de l'Économie Numérique* (DGDEN)[9] and ARPCE,[10] respectively. Institutional strengthening was achieved through provision of technical assistance, consultations, capacity building, and trainings on digital legal, regulatory, and institutional topics (for example, Cybersecurity, IXP management, .cg domain name management, industry promotion, privacy).

Mobilizing Private Sector Financing

57. The project aimed to spur private participation in the CAB management, maintenance, and commercialization through a PPP structure that could ensure investment, operation, and maintenance decisions are made on a sound commercial basis. For security and sovereignty reasons, the Government decided to retain ownership of the infrastructure. As described previously, the GoC did not support a PPP management arrangement for the infrastructure and did not create the SPV anticipated at appraisal.

Poverty Reduction and Shared Prosperity

58. It may be too early to assess comprehensively the project's impact on poverty reduction and shared prosperity in the RoC. Nonetheless, the economic analysis outlines the largely positive effect the

[8] Facebook Audience Insights, accessed June 18, 2019.
[9] DGDEN is the technical body that assists the MPTNTC in the field of the digital economy, including e-government, e-business and e-citizen services.
[10] The regulator is in charge of (a) contributing to the development of postal and electronic communications regulations and providing technical advice on their development; (b) ensuring the enforcement of laws and regulations governing the postal and electronic communications sectors; (c) preparing and maintaining, in conjunction with the other relevant ministerial departments and public security agencies, the texts setting out the rights and obligations of operators of substations and electronic communications networks; and (d) defining, establishing, and monitoring quality of service standards in the postal and electronic communications sectors.

project has had on the economy. There are good grounds to expect continuing positive effects in the RoC, with an upward trend in access to broadband services. According to 2019 GSMA data, RoC mobile 2G, 3G, and 4G penetration is above both that of the region and of Sub-Saharan Africa. Based on economic analyses conducted, it is expected that increase in mobile data use will result in GDP per capita growth as a result.

Other Unintended Outcomes and Impacts

59. The network infrastructure was built along the railway roads of the public train company CFCO. The company in charge of civil works for the fiber optic infrastructure had to create several rural access roads along the site to carry out the construction. These roads can be seen as a positive collateral of the project. Once the infrastructure is commercialized, five railway stations connected along the cable will benefit from high-speed broadband access.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

Regional Context and Lessons Learned

60. The project was designed as a country-level project under the regional CAB umbrella, addressing both regional and national priorities and challenges. The World Bank had extensive experience in the sector and in the region, including through the other CAB projects. The project design considered lessons learned from past and ongoing telecommunications infrastructure and regulatory reform projects, as well as emerging best practices on management structures for high capacity broadband backbone networks, as outlined in the PAD. A Leontief economic analysis had been done as part of preparation, making the case for the positive impact of the project on economic growth and employment. Lessons from the Africa Coast to Europe (ACE) Submarine Cable and West Africa Connectivity Program (WARCIP) program were applied, whereby a hybrid PPP model was considered that could allow the GoC to maintain ownership of its infrastructure while delegating its management.

61. The political and sectoral dialogue at the time of appraisal indicated the willingness of the GoC to establish and prioritize the establishment of a PPP under the project. The establishment of a PPP working group during preparation and detailed options for structuring of a PPP in the RoC in the PAD are indicative and detailed discussions that took place. Prior technical assistance and interventions to improve the regulatory and market environment had also aimed to enable more competition and reduce wholesale and retail broadband prices. The project built on the ongoing policy dialogue in the ICT sector in the RoC since 2008 and aligned with the country's Cyberstrategy.

Assessment of Risks

62. The favorable fiscal situation in the RoC, characterized by regular budget surpluses since 2003, combined with the global vision of the GoC on the ICT sector led the initial project to be very ambitious, hoping on counterpart funding.

63. Assessment of risks in the beginning of the project were suitable. These include risk to the PPP and risk of noncompletion of the national backbone infrastructure—the PCN—to which the CAB network was to connect. The PAD outlined in detail the potential PPP arrangements and planned to finance the development of laws and tools for regulators to support greater law enforcement capacity early in implementation to reassure potential investors and finance a comprehensive study including PPP options and technical infrastructure appraisal. It anticipated political dialogue and technical assistance for GoC and working with the Government-created PPP Commission to help review risks and solve issues related to PPP creation. The project also planned for scenarios whereby the PCN would not be completed in time for the CAB's infrastructure to be connected and operationalized. Nonetheless, the mitigation measures to ensure a PPP was established were insufficient.

B. KEY FACTORS DURING IMPLEMENTATION

64. Project implementation, overall, appears effective. The financing was almost completely disbursed: 98.05 percent of the US$20 million IDA commitment were disbursed, and all the counterpart funding was received by project closing.

65. Initial implementation was slow in several areas of the project. The project date of effectiveness was December 19, 2011, over three months after the initial planned date of September 12, 2011, though this is not uncommon for low-capacity countries. Conditions for disbursement were also delayed, in particular the signing of the MoU between the Project Implementation Unit (PIU), the Directorate General for the Environment (*Direction Générale de l'Environnement*, DGE), and the departments involved in the project to clarify the respective roles of the said departments in the implementation of safeguard measures, to define the attributions, modalities, and costs of intervention and monitoring by the DGE. Component 1 spent over a year on the completion of studies, such that the implementation of their findings did not begin to take place until 2013. Similarly, activities under Component 2 for the construction of the cable were delayed several times. Factors affecting implementation have been described in part in the descriptions of restructurings, and are outlined further below.

66. **Negative and persistent impacts of the 2014 drop in oil prices.** As detailed in the description of restructurings, the macroeconomic context was especially challenging, and resulted in issues in counterpart funding, increases in costs, and likely affected the international call for tender for the PPP. The project faced severe delays in the release of counterpart funding which put the project at risk of not achieving its objectives. This resulted in a delay in paying the manufacturer and the audit of the network, which in turned risked delay the full operationalization of the network which was vital to the international connectivity of the RoC and its connection to Gabon. This project was not alone in this, and restructurings were carried out across projects in the RoC to address this challenge. The CPS FY13–16 acknowledged

these challenges and outlined the necessity to find "a lasting solution to the irregular and arduous release of counterpart funding, which has caused enormous implementation delays in some projects" and "early project restructuring to avoid prolonged stays in problem status."

67. **Structural inertia due to the country political economy.** From this perspective, the political resistance to the proposed creation of an SPV that would own all the fiber optic network infrastructure in the country and establishment of a PPP affected the commercialization and thereby utilization of the regional network. While there were promising signs early on in the project and ISRs note the SPN was endorsed by the Government in January 2014, the company should have been legally established by March 31, 2014. The 2015 reshuffling of Government can in part explain the loss of initial political support and leadership of the MPTNTC for the establishment of an SPV and PPP. Perhaps the team could have considered alternatives to a PPP which would have been preferable to the three-year contract signed by the GoC in 2018. The decision to sign a three-year contract with Skytic had a clear negative impact on the project's outcomes.

68. **Lack of transparency regarding the PCN.** The lack of information regarding progress on the PCN linking Brazzaville to Pointe-Noire and on the governance of the future infrastructure posed a risk for the project and to the development objectives. Therefore, the project team decided to extend the financed infrastructure to Pointe-Noire and connect to the WACS landing station, thus bypassing the PCN for international connectivity and mitigating associated risks.

69. **Coordination with other World Bank CAB projects.** Coordination between the different projects in the region facilitated discussions, the signing of the MoU between the GoC and the Government of Gabon, and helped raise the profile of CAB projects within the countries.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

70. The PDO indicators used in this project are aligned with those of the CAB Program and previous CAB projects. As has been assessed in the ICRs of CAB 1 and CAB 2, the PDO indicators adequately illustrated the aims of the project. The indicators selected provided quantitative baselines and clear targets against which progress toward objectives were assessed. The ICR for CAB 2 (Democratic Republic of São Tomé and Principe) assesses the indicators selected appropriately measure access and usage, as well as affordability of connectivity.

M&E Implementation and Use

71. The project team was without an M&E specialist for a year in 2012, as with the other CAB projects at the time. From 2013, the PIU included a full-time M&E staff, and M&E data were systematically collected. After initial bottlenecks with data collection by the ARPCE were addressed, a detailed quarterly

report was produced. The staff was promoted from assistant to specialist, and the M&E ratings improved from Moderately Satisfactory to Satisfactory after the first restructuring and to Highly Satisfactory after the fourth.

72. The project made active use of the M&E framework and the collected data in project monitoring, including the restructuring processes, and the project team's dialogue with the regulator on pricing. The M&E framework served as the basis for the finalization of the regulatory texts on price floors and data continues to be collected by the ARPCE.

73. The third restructuring proposed new indicators and targets to be met by the extended closing date. However, project documentation suggests that perhaps these new indicators (and some original ones) were not consistently tracked. For instance, two output-based indicators were added to monitor the construction of the infrastructure: (a) number of kilometers of fiber optic laid out and (b) number of urban zones connected to the backbone, but these were not tracked in subsequent ISRs and later removed.

Justification of Overall Rating of Quality of M&E

74. The quality of M&E is rated to be Substantial, given the quality of implementation, regular dissemination and utilization in project implementation.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

75. The environmental assessment category was rated B at appraisal. The project included a significant infrastructure development component, with some environmental and potential social cost. The project triggered environmental safeguard policy OP/BP 4.01; consequently, an Environmental and Social Management Framework and an Environmental and Social Impact Assessment were produced. The environment risk rating is Moderate.

76. The project triggered also OP 4.10 and OP 4.12 and a Resettlement Action Plan (RAP) was prepared. Due to project redesign (the construction of the network along railways), the RAP was not fully implemented, and a new RAP was created. An audit conducted in March 2017 recommended a functional Grievance Redress Mechanism be created, complaints be recorded and documented, and compensation be provided. These were taken into account and implemented by the project.

77. Safeguards were rated as Satisfactory. In 2015, after a first inventory of lost property, and in accordance with the expert reports of the parcel commission, compensation was paid to all concerned in April 2016. Twenty-one complaints were recorded in 2016 as a result of the damage suffered by the destruction of trees and fields, particularly in sections 5 and 6, between Makabana and Mbinda. All complaints were resolved by August 30, 2016. In 2017, as a result of the project's social audit, additional complaints were registered, and the rehabilitation of a water point in Mayitoula in Niari was done, for a total amount of XAF 15,000,000. By December 2018, compensations were all granted to the targeted communities.

78. The project's financial management was Satisfactory**.** While the fiduciary risk rating was Substantial at the start of the project, the rating was Low after the first restructuring in 2015. A World Bank financial management specialist based in the Brazzaville country office supported the project through implementation. Financial management performance was rated as Satisfactory throughout most of project implementation as the project maintained acceptable financial management arrangements. Audits were provided in a timely fashion and were not modified.

79. The project's procurement performance was Moderately Satisfactory. The PCU regularly updated the Project Procurement Manual to take into account constraints, opportunities, and new data to improve project performance. Seven updates were carried out between the preparatory phase of the project and its first year of implementation, and once a year from 2013.

C. BANK PERFORMANCE

Quality at Entry

80. The project drew on the experiences of World Bank-financed telecommunications and ICT projects and programs in the region and built on the World Bank's policy dialogue in the ICT sector in the RoC. Since 2008, the GoC and the World Bank and have been engaged in a policy dialogue on the ICT sector to inform project design by providing an overview of the complexities of the country's political economy and the sector.

81. The project integrates all stakeholders in the sector (MPTNTC, DGGT, ARPCE, Congo Telecom, private operators, and the Ministry of Planning); was substantially aligned with the country's first Cyberstrategy; and relied on national institutions for the beneficiaries of the project. With regard to legal and institutional reforms, the project took into account past achievements in the sector, focusing on the remaining bottlenecks identified by stakeholders.

82. Without legal provisions requiring the establishment of an Open Access regime, SPV, and PPP, the project was nonetheless limited in its ability to ensure these critical elements of the CAB project were implemented. The Financial Agreement did not include dated covenants or conditions for withdrawal or effectiveness related to these, unlike other subsequent CAB projects in DRC and Gabon.

Quality of Supervision

83. The World Bank team ensured close supervision of the project. The team is to be commended for its support of the PIU throughout the project and its adaptability to the challenging context in the RoC, including to complete the construction of the network when the GoC was not able to provide the necessary counterpart funding. The task team leader was based in Brazzaville from 2016 to 2017, and over 25 missions were conducted throughout the project. The restructurings and AF indicate the adaptive capacity of the team to the needs of the GoC, macroeconomic shifts, and the complexities of the project. Frequency of supervision was complemented by remote support. Issues were identified in a timely manner. Progress of project implementation and discussions with government were documented through

detailed Aide Memoires. Additionally, the PIU benefited from trainings on financial management, procurement, and safeguards, which had positive impacts on project management.

84. While the assessment of risks was updated several times throughout the project's ISRs and the risk to outcome from the PPP issue was flagged repeatedly to the government and in Aide Memoires and ISRs, mitigating measures could have been updated in subsequent ISRs. Management of risks by the task team was proactive given the substantial political environment and governance risks. For instance, the creation of the SPN was identified as one of the prior actions in the first discussions of the DPO series (P165815). The removal of this prior action by the GoC during the preparation phase confirmed the political sensitiveness of the matter. The team's actions were complemented by a proactive PIU and the high visibility of the project, which was enhanced by a communications consultant from 2016. Counterpart funding remained a challenge throughout the project, and was addressed through restructurings.

Justification of Overall Rating of Bank Performance

85. The overall rating of World Bank performance for this project is Moderately Satisfactory. The project was one of only a few that secured counterpart funding in spite of the macroeconomic climate. While there were some shortcomings at entry and during implementation, the World Bank laid the groundwork for an Open Access regime and PPP but implementation of this is beyond the control of the project.

D. RISK TO DEVELOPMENT OUTCOME

86. The risks that the development outcomes will not be sustained and the risks to the overall institutional framework for sustaining the project results are Substantial.

(a) **PDO 1.** Rapid operationalization of the infrastructure is critical to ensure it is not rendered obsolete. While the network is still yet to be commercialized, the new call for interest issued in July 2019 is encouraging. The RoC's engagement with AfDB and the creation of the Kinshasa-Brazzaville link are indicative of ongoing commitment to regional integration. However, the RoC will need to finalize its policy agreements with neighboring countries for international traffic to follow. The risk to PDO 1 is Substantial, but it is hoped the Government will take the necessary actions to ensure its network can be utilized in the next six months.

(b) **PDO 2.** The institutional risk that the regulatory environment will not continue to develop favorably is Moderate. The regulator has capacity to effectively regulate the market, but the use of price floors in recent years suggests a risk to the achievement of lower, affordable prices for broadband.

(c) **PDO 3.** Despite risks to the positive developments in prices, there is a Low risk that that the level of usage would not continue to grow in the RoC. The market environment continues to be favorable for consumers, and numbers of users continued to grow in spite of price floors.

V. LESSONS AND RECOMMENDATIONS

87. **Creation and establishment of the SPV and PPP.** The establishment of a PPP structure was identified early on as a critical element for the effective and efficient operationalization of the network. Throughout the life of the project it encountered major implementation difficulties. Additional measures such as inclusion of the creation of an SPV as a legal covenant or condition for disbursement and review of PPP legislation early on in the project could help avoid the political and institutional challenges that the project faced and risks to sustainability it now faces. Such withdrawal conditions have been included in the Central African Backbone - APL4 - Gabon (P122776) and Central African Backbone - SOP5 - Democratic Republic of Congo (P132821) projects, requiring the creation and establishment of SPVs and PPPs. Additionally, future projects will need to consider time needed to create and establish SPVs and PPPs such that they allow sufficient time for their implementation of the management and maintenance of the ICT infrastructure set up or transferred, before project closing. Without strong political commitment to an Open Access regime, however, the risks will remain, as was seen in Burundi where a PPP was established under the AFCC2/RI-Regional Communications Infrastructure Project (P094103), only for the status to be revoked in 2017. Alternative measures should be considered for when the political economy and government policy may not be conducive to PPP arrangements. Questions of PPP readiness, timing, and measurement of success of PPPs in this sector remain and could merit further research.

88. **Regional integration and coordination with AfDB.** The regional aspect of the project was an asset to the initiative. The inter-ministerial meeting was a catalyst and raised the profile of the project and stimulated project implementation. We can also expect sustainability as the government is continuing regional expansion with AfDB. Indeed, the AfDB project includes support for the regulation of the wholesale data market "by fully enforcing the 'open access' principle on each optical fiber to ensure minimal competitive conditions on access costs, to the benefit of end users in Congo." According to the AfDB's project description, "all these activities will be part and parcel of activities to extend ICT sector reforms funded by the World Bank within the framework of the CAB project."

89. **Financing and costing.** In view of the economic crises in the country, 100 percent of the financing for the next operations should come from IDA funds. Additionally, to avoid cost overruns and mitigate the impacts of currency fluctuations, future projects may benefit from additional political economy and risk analysis, as well as contingency funds factored into projects from the design stage.

90. **High-level support.** Many reforms have a high political content or depend to a large extent on the political will and direction of high authorities of the State. When this is the case, a project benefits from the presence and activism of a supervising committee including representatives of the political authorities, so that orientations and decisions that need political clearance can be taken on a timely and proper manner. For example, the installation of equipment to network the main ministries based in Brazzaville, based on a fiber optic network was made through the CG Rep: Transparency & Governance Repeat Project (P122990) that closed in 2010. The network is now fully operational with traffic exchanged, and maintenance works managed by the DSI of finance ministry, who during the project implementation, was too weak for handling the equipment.

91. **Stakeholder engagement and communications.** This project required a significant amount of sensitization. The recruitment of a communications specialist in the PIU was a valuable addition and helped promote the project across stakeholder groups and build awareness. While stakeholder engagement early in the project was valuable, regular dialogue with the operators could help further identify regulatory and policy bottlenecks, and could have provided a better understanding for the failure of the PPP and potential alternatives. Additionally, collaboration with the International Finance Corporation could help determine key conditions and levers for further increasing private sector investment in the ICT sector.

92. **Transition planning.** Early planning and collaboration between GoC, the PIU and the World Bank to ensure a smooth transition of ownership and management of the infrastructure. While in this project the management contract was awarded outside the scope of the project, this could help ensure the sustainability of development outcomes and of the assets financed under this project.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: To increase geographical reach & usage of regional broadband network services & reduce their prices

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Volume of international traffic- International internet bandwidth (bits per second person)	Number	51.00 31-Dec-2009	500.00 30-Jun-2016	3341.00 28-Feb-2019	15500.00 31-Dec-2018

Comments (achievements against targets):
The target for this indicator was surpassed (470% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Access to Internet Services (number of subscribers per 100 people)	Number	6.10 31-Dec-2010	15.00 30-Jun-2016	40.00 28-Feb-2019	42.00 31-Dec-2018

Comments (achievements against targets):
The target for this indicator was surpassed (106% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average monthly price of wholesale international E1 capacity link from capital city to Europe	Amount(USD)	3200.00 31-Dec-2010	800.00 30-Jun-2016	892.00 28-Feb-2019	1465.00 31-Dec-2018

Comments (achievements against targets):
The target for this indicator was not reached (75% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	50000.00 31-Dec-2010	800000.00 30-Jun-2016	1732051.00 28-Feb-2019	2119873.00 31-Dec-2018

Comments (achievements against targets):
The target for this indicator was surpassed (123% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Female beneficiaries	Percentage	50.00 31-Dec-2010	50.00 30-Jun-2016	37.00 28-Feb-2019	35.00 31-Dec-2018

Comments (achievements against targets):
This target was not reached (71% achievement).

The initial baseline was based on an assumption of equal access to broadband. The earliest data available using the ARPCE data for calculating the number of female beneficiaries is from 2015 (23%).

A.2 Intermediate Results Indicators

Component: Enabling environment, connectivity & promotion of ICT sector

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average cost of mobile call (three minutes, local, peak)	Amount(USD)	0.50 31-Dec-2010	0.10 30-Jun-2016	0.55 28-Feb-2019	0.16 31-Dec-2018

Comments (achievements against targets):
This target was surpassed (113% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at

				Target	Completion
Retail price of internet service (per 256kbit/s per month, in USD)	Amount(USD)	300.00 31-Dec-2010	80.00 30-Jun-2016	70.00 28-Feb-2019	74.00 31-Dec-2018

Comments (achievements against targets):
This target was almost reached (98% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Coverage of mobile network (percentage of population covered)	Percentage	89.00 31-Dec-2010	95.00 30-Jun-2016	97.00 28-Feb-2019	97.00 31-Dec-2018

Comments (achievements against targets):
This target was reached (100% achievement).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion

Number of operators and service providers buying capacity from the regional infrastructure deployed	Number	0.00 31-Dec-2010	5.00 30-Jun-2016	3.00 28-Feb-2019	0.00 31-Dec-2018

Comments (achievements against targets):
This target was not reached (0% achievement).

While the ISR 14 states that 1 operator/service provider was buying capacity from the regional operator, at the time of closing the infrastructure had yet to be commercialized. The value of this indicator at closing has therefore been revised to 0 in this ICR.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of localities with broadband internet access (128kbps)	Number	4.00 31-Dec-2010	10.00 30-Jun-2016	50.00 28-Feb-2019	43.00 31-Dec-2018

Comments (achievements against targets):
This target was not reached (85% achievement).

B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: To contribute to increase the geographical reach of regional broadband network services	
Outcome Indicators	1. Volume of international traffic - international internet bandwidth per person
Intermediate Results Indicators	1. Coverage of mobile network (percentage of population covered) 2. Number of localities with broadband internet access (128 kbps)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	**Component 1** 1. Technical assistance and trainings for DGDEN and ARPCE 2. Studies on portability and homologation 3. Development of national broadband plan 4. Creation of wholesale observatory 5. Establishment of an interconnection framework for CEEAC/CEMAC **Component 2** 1. Construction of the regional network between the RoC and Gabon
Objective/Outcome 2: To contribute to reduce the prices of regional broadband network services	
Outcome Indicators	1. Average monthly price of wholesale international E1 capacity link from capital city to Europe
Intermediate Results Indicators	1. Average cost of mobile call (three minutes, local, peak) 2. Retail price of internet service (per 256 kbit/s per month)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	**Component 1** 1. Loi de finance sur la Fibre 2. Development of national broadband plan

	3. Study on the charging and pricing of high-speed broadband capacity and analysis for the wholesale market studies on network quality **Component 2** 1. Establishment of national IXP 2. Construction of regional network between the RoC and Gabon

Objective/Outcome 3: To contribute to increase the usage of regional broadband network services	
Outcome Indicators	1. Number direct project beneficiaries (of which, female) 2. Access to internet services - number internet subscribers per 100 inhabitants
Intermediate Results Indicators	1. Number of operators and service providers buying capacity from the regional infrastructure deployed
Key Outputs by Component (linked to the achievement of the Objective/Outcome 3)	**Component 1** 1. Implementation of the management of the Congolese domain name ".cg" 2. Frequency management plan for ARPCE **Component 3** 1. Development of a national Cyberstrategy (*Congo Digital 2025*) 2. Legal and regulatory framework related to the 'Cyberstrategy', including the following: • Loi relative à la Cybersécurité • Loi portant lutte contre la Cybercriminalité • Loi relative aux transactions électroniques • Loi portant création de l'Agence Nationale de Sécurité des Systèmes d' Information

	• Loi portant Protection des données à caractère personnel 3. Optical fiber interconnection of the institutes of the *Université Marien Ngouabi* (UMNG) 4. Creation of the *Programme Universitaire d'Innovation en Technologies et Services* (PUITS) at the UMNG

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Jerome Bezzina	Task Team Leader(s)
Lanssina Traore, Clement Tukeba Lessa Kimpuni	Procurement Specialist(s)
Bella Diallo, Bertille Gerardine Ngameni Wepanjue	Financial Management Specialist(s)
Abdoulaye Gadiere	Environmental Specialist
Marolla Haddad	Digital Development Specialist
Jean-Pierre Lungenyi Ntombolo	Social Development Specialist
Joelle Nkombela Mukungu	Environmental Specialist
Audrey Ariss	ICR Author

B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY11	26.750	163,501.51
Total	**26.75**	**163,501.51**
Supervision/ICR		
FY12	12.550	78,434.11

FY13	15.575	89,372.96
FY14	13.276	95,310.95
FY15	12.499	339,833.00
FY16	9.040	69,470.43
FY17	18.178	134,213.86
FY18	16.937	163,072.33
FY19	18.727	153,903.27
FY20	3.981	17,855.34
Total	**120.76**	**1,141,466.25**

ANNEX 3. PROJECT COST BY COMPONENT

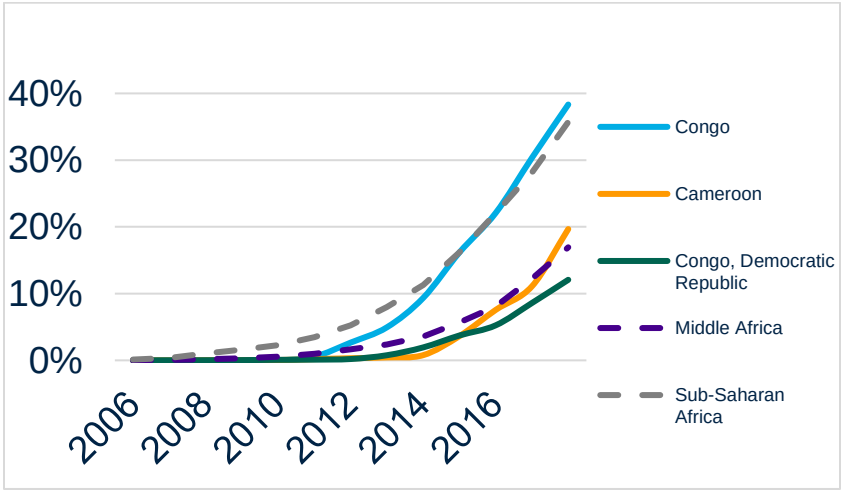
Components	Amount at Approval (US$, million)	Actual at Project Closing (US$, million)	Percentage of Approval (US$, million)
Component 1: Enabling environment at the regional and national levels	3.55	3.55	100
Component 2: Connectivity	9.00	12.40	138
Component 3: Promotion of ICT sector	1.00	2.20	220
Component 4: Project Management	1.00	1.50	150
Total	14.55	19.65	**135**

ANNEX 4. EFFICIENCY ANALYSIS

1. An Intersectoral Input-Output Analysis was conducted during project preparation. The Leontief analysis showed that investment in broadband infrastructure has a significant impact on employment and economic growth in the RoC: the demand of XAF 1 billion (US$1,895,849) for the Post and Telecommunication industry would result in a total impact of XAF 1.29 billion (US$2,448,768) in the new production of the economy. This method of analysis could not be replicated for this ICR.

2. The project does see a 'take off' in volume of international traffic, and 3G penetration after the project was launched. Mobile 3G penetration increased from 0 percent to 37 percent, higher than the average for the region (16 percent) and for Sub-Saharan Africa (33 percent). This trend is similar for 2G and 4G mobile penetration, though less pronounced. As technology develops, mobile services have the potential to impact economic development further through the provision of high value 3G and 4G data services accessed via smartphones, tablets and dongles that deliver mobile data services to businesses and consumers.

Figure 4.1. Broadband (3G) Penetration (source: GSMA)



3. According to a 2012 GSMA/Deloitte analysis of data on penetration in a panel of 96 developed and developing markets, a 10 percent substitution from 2G to 3G penetration increases GDP per capita growth by 0.15 percentage points.[11] The estimated economic benefits to the RoC can be linked to the economic multiplier effect of increased broadband penetration rates to the economy. According to World Bank research, each 10 percent increase in broadband penetration increases overall GDP growth in developing countries by 1.38 percent.[12] While GDP grew in the years following implementation of the

[11] Deloitte. 2012. *What Is the Impact of Mobile Telephony on Economic Growth?*
[12] World Bank. 2009. *Information and Communications for Development: Extending Reach and Increasing Impact*.

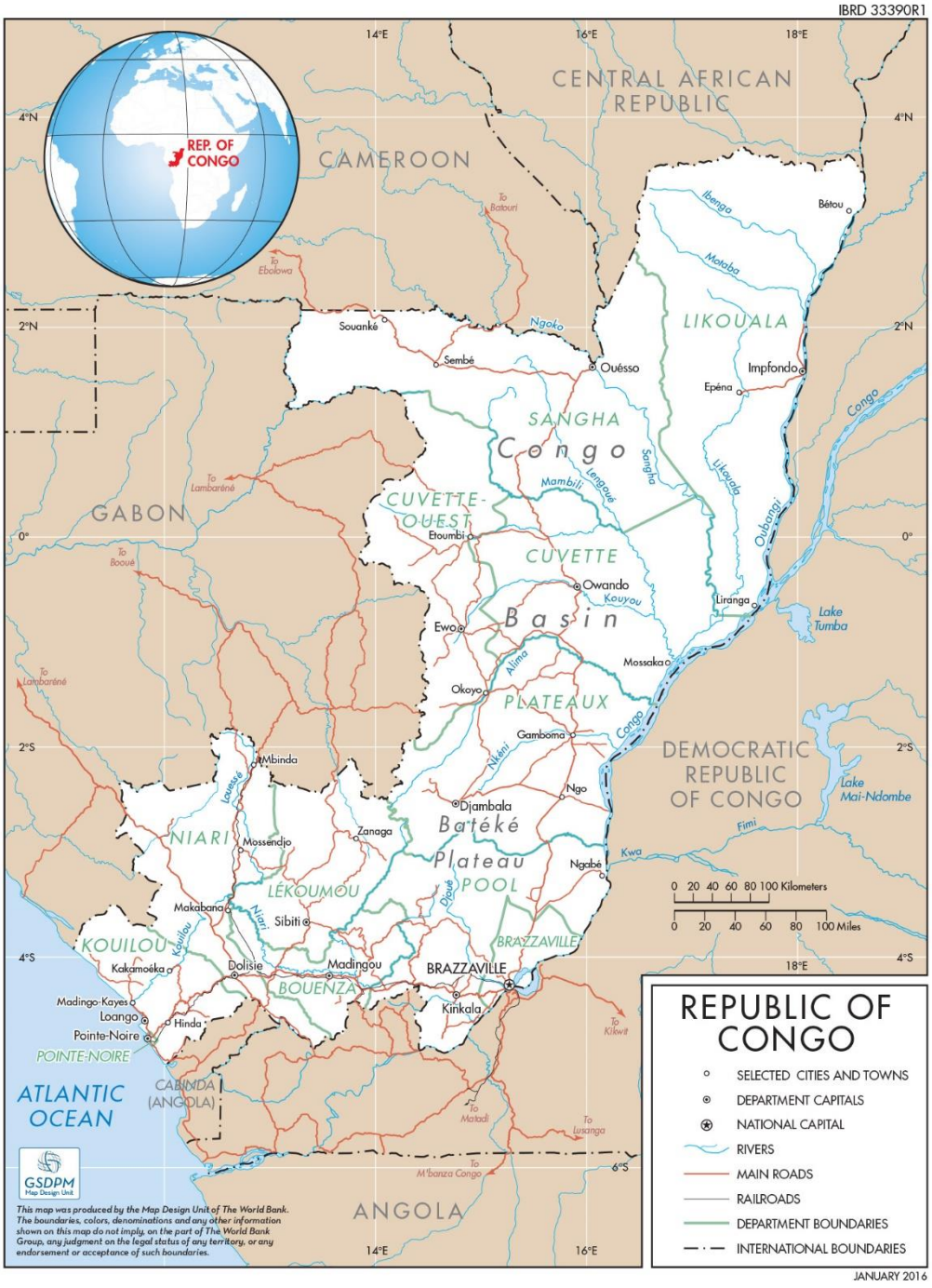
project, it decreased in 2016 and 2017, and changes in GDP can difficultly be attributed to the activities of the project.

4. It was not possible to carry out a financial analysis for this ICR, as no business plan or financial model has been received for the operationalisation of the network constructed by this project. It is anticipated, however, that once it becomes utilized the country will see lower prices and improved use of broadband services.

ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

The report was shared on September 14, 2019; no comments have been provided.

ANNEX 6. MAP OF THE REPUBLIC OF CONGO



ANNEX 7. SUPPORTING DOCUMENTS

1. Legal documents
    (a) Financial Agreement
    (b) Additional Financing Agreement
2. Project Appraisal Document
3. Restructuring documents [1–5]
4. Disclosable ISRs [1–14]
5. Mid-Term Review Report
6. Aide Memoires
7. Borrower's ICR
8. Country Partnership Strategy FY10–12, FY13–16
9. African Development Bank's Central African Backbone Project document