Report Number : ICRR0021089

1. Project Data

Project ID P130184	**Project Name** WARCIP APL 1C - Benin
Country Western Africa	**Practice Area(Lead)** Transport & Digital Development

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
IDA-51430	10-Jun-2017	35,000,000.00
Bank Approval Date	**Closing Date (Actual)**	
12-Jul-2012	10-Jun-2017	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	35,000,000.00	0.00
Revised Commitment	35,000,000.00	0.00
Actual	33,877,644.99	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
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2. Project Objectives and Components

a. Objectives

This project was the third in the series of the first phase of the Adaptable Program Loan (APL 1C) of the West Africa Regional Communication Infrastructure Program (WARCIP) aimed at increasing the geographical reach of broadband networks and reducing costs of communication services in West Africa. The first in the series (APL 1A) was in Liberia and Sierra Leone and the second (APL 1B) in Guinea, The Gambia and Burkina Faso.

The Project Development Objective (PDO) as stated in the Financing Agreement (Schedule 1, page 6) and in the Project Appraisal Document (PAD, page 6) was:

"To increase geographical reach of broadband networks and to reduce the costs of communications services in the territory of the Recipient."
This review is based on an assessment of the two sub-objectives. (i) To increase geographical reach of broadband networks (including in rural areas in Benin and linking to several other countries): (ii) To reduce the costs of communication services.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

There were three components (PAD, pages 7-9).
One. Supporting Connectivity. *Appraisal estimate US$30.50 million. Actual cost US$28.70 million.* This component aimed at Benin's participation in the Africa Coast to Europe (ACE) submarine cable consortium to meet the existing and future demand for internet bandwidth. The governance structure of the ACE submarine cable was designed as a Public-Private Partnership (PPP) structure and the design envisioned that the membership fee would be reimbursed to the government by private operators, once the PPP arrangements had been finalized. Activities included: (i) construction of the cable and the landing station: and, (ii) technical assistance for supporting Benin in selling the excess international capacity available through ACE to neighboring countries.
Two. Enabling environment for improved connectivity. Appraisal estimate US$3.25 million. Actual cost at closure US$4.07 million. This component aimed at providing support for creating a sound enabling environment. Activities included technical assistance for: (i) improving governance, ownership and financing of the ACE PPP Special Purpose Vehicle: (ii) developing the safeguards for open access to ACE capacity (Open access ensures that any eligible operator, whether part of the PPP or not, can access and use the available capacity of the cable on a non-discriminatory and fair basis); and, (ii) institutional strengthening of the Benin Telecoms (BTSA), the Special Purpose Vehicle (SPV), the Ministry and the regulatory authority.
Three. Implementation support. Appraisal estimate US$1.25 million. Actual cost US$1.71 million. This component aimed at providing project implementation support. Activities included financing the incremental operating costs, cost of audits, communications, Monitoring and Evaluation (M&E) and environmental and social studies and their implementation.
Some project activities (such as a regional study to expand the national backbone development of the legal and regulatory tools for open access to the ACE capacity and official studies for the government divestiture) were not completed for reasons discussed in Section 4. Some technical assistance activities were added, such as a study on the feasibility of the western fiber loop, the ICT Telecom Strategy Plan, support to the privatization of Benin Telecom, improvement of the legal form of Benin ACE PPP structure, the acquisition of equipment for the Digital Agency, the e-government pilot and the Internet Exchange Point.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project cost. Appraisal estimate US$35.00 million. Actual cost at closure US$34.48 million. The actual cost of component one activity was 6% lower and the cost of component two and three activities were 32% and 37% higher than estimated respectively at appraisal. The increase in cost of component two and three activities was covered through cost savings associated with some project activities.
Project financing. The project was financed by an IDA (including both national and regional IDA) total grant of US$35.00 million (inclusive of a Project Preparation Advance (PPA) of US$3.00 million). Amount disbursed at closure was US$34.48 million. There was parallel financing for complementary investments in the national backbone infrastructure (construction of the west link towards the Togo border, the link at the border with Burkina Faso and the rehabilitation of the link to Niger) from the Exim China Bank.
Borrower contribution. None was planned.
Dates. The project, which was approved on July 12, 2012, closed as per schedule on June 10, 2017.

3. Relevance of Objectives

Rationale

Benin's economy relies mainly on the agricultural sector (with the sector accounting for 32% of the Gross Domestic Product (GDP)) and providing employment to 70% of the population) and on re-export trade (re-export trade with Nigeria alone accounting for about 7% of GDP). The development of the Information Communication Technology (ICT) sector in the years before appraisal was slow and characterized by high cost, limited availability of internet capacity and low penetration of fixed lines due to a combination of factors including, the high cost of international bandwidth from the South Atlantic Three Cable (SAT- 3), a monopolistic structure for international connectivity, a high level of fiber theft, a weak legal and regulatory framework and delayed privatization of Benin Telecom. In the years before appraisal, the Government's development strategy aimed at improving regional connectivity and becoming a regional digital hub for distributing ICT capacity to the neighboring countries in West Africa, given its geographic position straddling Burkina Faso, Niger, Nigeria and Togo.
The PDO was consistent with the Government 2008 Sector Development Policy which highlighted the need for "*taking advantage of the country's privileged position and its access to international connectivity*" and becoming the "*Digital Capital of Africa*" (PAD, page 2).
The PDO was well-aligned with the Bank Country Assistance Strategy (CAS) for Benin (2009-2012) and the Bank Regional Assistance Integration Strategy for Sub-Saharan Africa (RIAS, 2011) at appraisal. The two key pillars of the (CAS were: Pillar 1 aiming at strengthening competitiveness and accelerating private-sector led growth and Pillar 2 dealing with growth-inducing infrastructure. The Bank recognized the key role ICTs can play in regional integration and increasing competitiveness of African economies. The project activities, which aimed at cheaper access to the internet and supporting the development of national and regional communications infrastructure was also in line with the Pillar 1 of Bank's Africa Strategy dated 2011 aimed at improving regional competitiveness. The 2017 Benin Country Diagnostic Concept Note that is currently under preparation identifies weak infrastructure services and constraint to trade and competitiveness as

some of the main challenges that hinder progress towards inclusive growth in Benin.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

Objective 1
Objective
To increase geographical reach of broadband networks (including in rural areas in Benin and linking to several other countries).

Rationale
Outputs. (ICR, pages 22-27 and 39-45).
- Benin was connected to the ACE submarine cable in 2016 (as compared to the target of by end of 2014). With this connection, the available capacity of the ACE cable increased from 190,840 Miu to 5,049,328 Miu (equivalent to 110 to 150 Gigabit (Gbit/second), depending on the distance of the transit capacity used), by 2016. The international capacity available in Benin increased to 22 Gbit/second in 2017, exceeding the initial target of 12 Gbit/second. The ICR (page 19) notes that 20% -25% of this capacity had been currently activated for use by various operators and that in addition, some operators were still using South Atlantic Three Cable (SAT-3) capacity for either primary or redundancy purposes.
- The regional connectivity study was completed, albeit funded by the government using its own resources. The resale of excess capacity to neighboring countries was contingent on the on-going construction activities (of the west link towards the Togo border, the link to the border with Burkina Faso and the rehabilitation of the link to Togo). According to the information provided by the team, these activities funded by the Exim-Bank of China, are currently being implemented and scheduled to be completed by the end of 2018.
- No formal studies were completed or decisions made on open access policies (intended to provide regulation of the capacity to ACE). According to the information provided by the team, a mature PPP model would include standard terms and conditions for the access to the essential infrastructure of the PPP entity, so that private sector players that are not part of the PPP structure could access and use the capacity. Since this was not the case in the PPP arrangements for this project, it is not clear if there are still barriers to entry to new internet service providers.

Outcomes.
- Volume of traffic in international communications (Internet, Telecoms and Data) bandwidth per person used by the citizens and businesses increased from 7.5 Kilobit per second (Kbit/s) at the baseline to 11.5 kbits in 2017. This was short of the original target of 14.10 kbits/s (PAD, page 23). It is not clear whether this indicator was based on availability of services to the population or users.
- Access to telephone services (fixed mainlines plus cellular phones per 100 people) increased from 79 at the baseline to 88.78 at project closure. This exceeded the original target of 87.
- Access to Internet Services (number of subscribers per 100 people) increased from 1.80 at the baseline to 25.17 at project closure. This exceeded the original target of 4.20. It is not clear whether the increase in the subscriber base was concentrated in the urban areas or more geographically-dispersed within the

country.
It is difficult to ascertain the extent to which the membership in the ACE submarine cable contributed to the development outcome. Assuming that the proxies used to monitor performance (volume of international traffic, percentage of population with access to telephone and Internet services) were realistic, it is reasonable to conclude that the project made a significant contribution to realizing the outcome and thereby to the long term objective of facilitating regional connectivity in West Africa and Benin.

Rating
Substantial

Objective 2
Objective

To reduce the costs of communication services

Rationale
Outputs.

- The outputs described above were also relevant to this objective.

Outcomes.

- Average monthly price of wholesale international E1 capacity link from capital city to Europe dropped from US$1300 per month at the baseline to US$960 per month at project closure. This was short of the target of US$250 per month.
- Retail price of Internet Services (per Mbit/s per month in US$) dropped from US$160 at the baseline to US$30 after the arrival of the ACE submarine cable in 2016. This exceeded the original target of US$60.00.

While it is difficult to ascertain the extent to which the project activities per se contributed to realizing the development outcomes, given that there were no set prices for ACE international connectivity, it is reasonable to conclude that the project made a significant contribution to realizing the outcome and thereby to the long term development objective of providing access to economic opportunities for Benin's poor and geographically sparse population.

Rating
Substantial

Rationale
While attribution is difficult to assess, it is reasonable to conclude that the project made a significant contribution to realizing the outcomes and thereby to the long term development objectives of facilitating regional connectivity in West Africa and Benin and providing access to economic opportunities for Benin's population.

Overall Efficacy Rating
Substantial

5. Efficiency

Financial Analysis. The potential economic benefits from ACE cable were assumed to come from the additional routes to the global digital backbone to meet the existing and future demand for international connectivity. The PAD (page 28) notes that cost effectiveness through investing in ACE was expected to be on the order of ten times cheaper than purchasing capacity on other African submarine cables linking to Europe, which was on average around US$500/Mbps/month. The financial analysis developed during project preparation showed that ACE would break even in 2017/2018 with: (a) an Internal Rate of Return (IRR) of 44.5% and Net Present Value (NPV) of US$90.5 million assuming an average bandwidth sale price of US$80/Mbit/month or (b) an IRR of 38.4% and NPV of US$62.5 million assuming an average bandwidth sale price of US$60/Mbit/month. The financial analysis conducted at project closure showed that all cash flows were positive since 2015, when operators started using Africa Coast to Europe (ACE) submarine capacity. The ICR however provides little details on the analysis followed in calculating the financial analysis. Quantitative economic analysis of the impact of the ACE connectivity was not calculated both at appraisal or at project closure. The ICR notes that research ("*Economic Impacts of Broadband*" published by the Bank showed that a 10% percentage point increase in broadband penetration increases overall GDP growth in developing countries by 1.38 percentage points. It is unclear how relevant are the general and hypothetical conclusions of the research to this project.

Administrative and Operational efficiencies. Despite the payment of the ACE cable membership fees on time, there were delays in the construction of the landing station in Cotonou. Benin was connected to the ACE only in February 2016 and only about 20% of the capacity was used by the various operators at project closure. It was not clear from the ICR whether alternative options for increasing capacity (such as the option of liberalizing access to the existing South Atlantic 3 fiber Optic Cable (SAT-3), upgrading SAT-3 or reinforcing the sector through legislation and regulation) had been considered prior to deciding on investing in the second submarine cable. According to the subsequent information provided by the team while increasing capacity was one of the constraints, neither an upgrade of SAT-3 nor an improvement of the regulatory environment would have addressed Benin's need for a redundancy route to the global internet, as the country had been subject to frequent cable cuts that isolated it from the rest of the world for weeks (such as the major ones in 2007 and 2009 when several West African countries were cut off from the rest of the world for several days). The information provided by the team further indicates that a detailed analysis conducted at appraisal showed that ACE landing and connecting to a second submarine cable would increase capacity, improve service delivery and be the cost-effective long-term solution for Benin but also strengthen

the regional connectivity of landlocked countries (such as Niger). The efficiency savings from selling the excess capacity however had not yet materialized (the PAD assumed that at least 20-40% of the efficiency savings would come from the sale of excess capacity to Niger, Burkina Faso and Togo), as the resale of excess capacity to neighboring countries was contingent on the on-going construction of the inter-country links.

Efficiency Rating
Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 ☐Not Applicable
ICR Estimate		0	0 ☐Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

Relevance of the PDO to the Government and Bank strategies is rated as Substantial. Efficacy of the two objectives - to increase geographical reach of broadband networks and to reduce the costs of communication services, was rated as Substantial. While it is difficult to ascertain the extent to which the project activities contributed to the outcome, it is reasonable to conclude that the activities made a significant contribution to realizing the PDOs. Efficiency was rated as Modest in view of the weak Economic and Financial Analysis and administrative and operational inefficiencies.

a. Outcome Rating
Moderately Satisfactory

7. Risk to Development Outcome

Governance commitment. Although the PPP had been formed in December 2012 in the form of an Economic Interest Grouping (GIE in French), it is not clear if the international connectivity market is competitive with no or minimal barriers to entry (ICR, page 19, para 54). The ACE GIE was not yet a commercial entity where shareholding was separate from the commercial activities of access to capacity. The Government at project closure retained 46% of shares in ACE GIE (and had not yet divested its remaining shares to operators in

neighboring countries and other domestic new participants as envisaged at design).
Institutional Risk. Although the project envisioned leveraging Benin's geographic position to provide transit capacity to neighboring countries, this is contingent on the existence of an extensive and reliable fiber backbone transit network that can carry the capacity from Cotonou to neighboring countries. Given that the construction of the link is still ongoing with funding from Exim Bank China, it is not clear when Benin would be able to commercialize its excess capacity.

8. Assessment of Bank Performance

a. Quality-at-Entry

This project was based on lessons from an ongoing Bank financed project in Benin (E-Benin Project) and from prior Bank financed projects (APL 1A and 1B and the Central African Backbone (CAB) Project) supporting governments to structure PPP for international, regional and national connectivity. Lessons incorporated at design included addressing challenges in structuring PPPs in the country context. The preparation of the project was aided by an IDA grant Project Preparation Advance (PPA) for preparatory activities aimed at improving international connectivity and the design and establishment of the Africa Coast to Europe (ACE) PPP. The project was prepared quickly to meet the firm deadlines associated with Benin's admission to ACE. Several risks were identified at appraisal including the risks associated with non-cooperation from the private sector in the PPP arrangements, political risks associated with government failure to commit to project design and risks of government corruption. Mitigation measures incorporated at design included increased dialogue, participatory decision making with the private sector and technical assistance to the government. The overall project risk was rated as Modest at appraisal. The arrangements made at appraisal for safeguards and fiduciary compliance were appropriate (discussed in Section 10).
It was unclear in the ICR if the different options for increasing additional capacity (such as through, liberalizing access to the existing submarine cable (SAT-3), upgrading SAT-3, or reinforcing the sector through legislation and regulation were considered at design, prior to investing in a second submarine cable (given that Benin is a small low-income country of nine million people). According to the subsequent information provided by the team, existing capacity was not the only constraint at appraisal (the country had been subject to frequent cable cuts that isolated it from the rest of the world for weeks) and that other options would not have addressed Benin's need for a redundancy route to the global internet). The information provided by the team further indicated that analysis conducted at appraisal showed that connecting to a second submarine cable would not only increase capacity, provide better service and be the cost- effective long-term solution for Benin but would also strengthen regional connectivity of landlocked countries, such as Niger (Niger's connectivity is now secured because of ACE landing in Benin).

Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

Supervision missions of on average twice a year were supplemented by remote support by the task team. Although there were three changes in project Task Team Leader (TTL) during the lifetime of the project,

continuity was maintained due to well-planned handover missions and arrangements. Further, the final project TTL had been a core member of the ongoing Bank financed e-Benin project from its inception. The team along with the implementing agency were flexible in making adjustments to the design and costs of activities within each component. Support provided by the team aided in safeguards and fiduciary compliance (discussed in section 10).
It is unclear if there was adequate supervision support for sector reforms aimed at ensuring competition in the international connectivity segment.

Quality of Supervision Rating
Satisfactory

Overall Bank Performance Rating
Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
The five key outcome indicators were appropriate for monitoring project performance. Three indicators of these - volume of international communications (internet, telecom and data), bandwidth per person, access to internet services (internet users per 100 people) and access to telephone services (fixed mainlines plus cellular phones per 100 people) - were appropriate for monitoring performance with respect to increasing the geographical reach of broadband networks. The indicator- average monthly price of wholesale international communications at project closure - was appropriate for monitoring performance with respect to reducing the costs of communication services. The last outcome indicator - the number of project beneficiaries (including female beneficiaries - was appropriate for monitoring performance with respect to both the objectives. The main data for monitoring and evaluation of the outcome indicators was to be collected by the private sector operators and by the regulator and was to be based on data used by operators and international organizations.
While the project activities aimed at increasing the geographical reach of broadband networks, there were no disaggregated indicators aimed specifically at internet users outside of the cities.

b. M&E Implementation
Since the Project Implementation Unit was already managing the e-Benin project, an M&E specialist was on staff from the project onset. However, reports and annual progress reports were not generated as per the provisions of the Project Implementation Manual and PDO indicators were not regularly reported during implementation.

c. M&E Utilization
The M&E indicators were used for monitoring project performance.

M&E Quality Rating
Modest

10. Other Issues

a. Safeguards
The project was classified as a Category B project for environmental purposes. Other than environmental assessment (OP/BP 4.01), three safeguard policies were triggered: Natural Habitats (OP/BP 4.04): Physical Cultural Resources (OP/BP 4.11): and, (iii) Involuntary Resettlement (OP/BP 4.12).
Environmental Assessment, **Natural Resources and Physical Cultural Resources**. The PAD (pages 18 and 19) notes that that the project was not expected to have significant adverse environmental impacts. The project was to be implemented in a sea relatively rich in marine biodiversity with several fish species and marine habitats that could be affected by the project activities. The project could also affect physical cultural resources on land. An Environmental and Social Management Plan (ESMP) was prepared for mitigating the impact during construction and operation such as, not undertaking works during critical birthing/nesting times for whales and turtles, managing waste management skills, guidance for avoiding cultural sites and managing "chance finds". The ICR (page 32) notes that the execution of social and environmental plans was deemed to be satisfactory during implementation.
Involuntary Resettlement. The PAD (page 19) notes that there could be potential impacts on people in the proposed project area. A total of ten properties involving six Project-Affected-People (PAP) and some businesses and institutions could be affected by the project. An Abbreviated Resettlement Action Plan (ARAP) was prepared and publicly-disclosed at appraisal and a grievance redress system was put in place to address involuntary resettlement issues. The ICR (page 21) notes that compliance with involuntary resettlement safeguards was deemed to be satisfactory during implementation.

b. Fiduciary Compliance
Financial Management. The Project Implementation Unit of an ongoing IDA project was in charge of financial management. An assessment conducted at appraisal to assess the financial management capacity of the implementing agency, concluded that the financial management arrangements were satisfactory and the financial management was rated as Moderate (PAD, pages 17 to 18). There was financial management compliance. The ICR (page 32) notes that the Project Implementation Unit maintained accurate accounts and statements for the project, submitted interim reports on time and that unqualified financial audits were submitted in a timely manner.
Procurement. An assessment conducted at appraisal to assess the procurement arrangements of the implementing agency concluded that these arrangements were satisfactory and the Procurement risk was rated as Moderate (PAD, page 18). The ICR(page 33) notes that although there were delays, there were no procurement issues during implementation.

c. Unintended impacts (Positive or Negative)

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d. Other

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11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	---
Bank Performance	Satisfactory	Satisfactory	---
Quality of M&E	Modest	Modest	---
Quality of ICR		Substantial	---

12. Lessons

The following were the main lessons drawn by the ICR from the experience of implementing this project, with some adaptation of language (page36-38).
(1) The PPP model by itself may not guarantee competition. The PPP structure, as adopted in Benin, was restricted to the existing shareholders and this presents a barrier to entry to new or small service providers.
(2) Better arrangements at design are needed to ensure divestment of government shares.
The government's shares in the PPP created (Groupement d'Interest Economique (GIE) were not divested, as designed.
(3) Given that compared to other sectors (such as health and education), the ICT market evolves more rapidly, indicators in ICT projects may need to be revised more often and reassessed against current market development trends. In this project, targets set at appraisal for indicators such as the percentage of population with access to internet services were surpassed by the second half of the project, partly due to project outputs and partly due to other domestic and international factors such as lower cost for network rollout and more affordable end user handsets. A revision of indicators and reassessment of targets during implementation would have been useful for a more realistic assessment of the project.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is well-written and provides a candid analysis of the problems that were encountered during implementation. The project draws good lessons from the experience of implementing this project.
Given that PPP arrangements in this project were different from the PPP arrangements in other projects from the West Africa Regional Communications Infrastructure Program), the ICR could have provided a better description of the PPP arrangements. The ICR could have provided an English translation of Annex Six, which contains useful information about project implementation (ICR, pages 52-56).

a. Quality of ICR Rating
Substantial