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The World Bank

Report No: ICR00004098

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-40860, IDA-51290)

ON A

CREDIT

IN THE AMOUNT OF SDR 132.7 MILLION (IDA-40860) AND SDR 77.5 MILLION (IDA-51290)
(US$ 320 MILLION EQUIVALENT)

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR A

SECOND NATIONAL URBAN WATER SECTOR REFORM PROJECT

May 21, 2018

GWA08
AFCW2
AFRVP

CURRENCY EQUIVALENTS

(Exchange Rate Effective 12/31/2017)

Currency Unit = SDR
1.00 = US$ 1.424130
US$ 1.00 = 0.702181

FISCAL YEAR 2018

ABBREVIATIONS AND ACRONYMS

AFD	Agence Française de Développement (French Development Agency)
BCR	Borrower Completion Report
CPS	Country Partnership Strategy
CRSWBL	Cross River State Water Board Limited
ESMF	Environmental and Social Management Framework
FMWR	Federal Ministry of Water Resources
FPIU	Federal Project Implementation Unit
IDA	International Development Association
ICR	Implementation Completion Report
LSWC	Lagos State Water Corporation
NWRCBNet	National Water Resources Capacity Building Network
M&E	Monitoring and Evaluation
NEEDS	National Economic Empowerment and Development Strategy
NUWSRP2	Second National Urban Water Sector Reform Project
NUSWRP3	Third National Urban Water Sector Reform Project
O&M	Operations & Maintenance
PAD	Project Appraisal Document
PDO	Project Development Objective
PFMU	Project Financial Management Units
PIU	Project Implementation Unit
PSP	Public-Private Sector Partnership / Private Sector Participation
PPP	Public-Private Partnership
RPF	Resettlement Policy Framework
SPIU	State Project Implementation Unit
SWA	State Water Agencies
RPF	Resettlement Policy Framework

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SECOND NATIONAL URBAN WATER SECTOR REFORM PROJECT
Federal Republic of Nigeria

Contents

ICR Datasheet

A. Basic Information

Country:	Nigeria	Project Name:	Second National Urban Water Sector Reform Project
Project ID:	P071391	L/C/TF Number(s):	IDA-40860,IDA-51290
ICR Date:	05/21/2018	ICR Type:	Core ICR
Lending Instrument:	SIM	Borrower:	GOVERNMENT OF NIGERIA
Original Total Commitment:	XDR 132.70M	Disbursed Amount:	XDR 204.95M
Revised Amount:	XDR 204.95M		
Environmental Category: B			
Implementing Agencies: Federal Ministry of Water Resources Cross River State Water Board Limited Lagos Water Corporation			
Cofinanciers and Other External Partners: Agence Française de Développement			

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	12/14/2001	Effectiveness:	11/15/2005	11/15/2005
Appraisal:	04/13/2005	Restructuring(s):		03/31/2011 06/19/2012
Approval:	07/01/2005	Mid-term Review:	03/10/2009	10/12/2009
		Closing:	06/30/2011	05/31/2016

C. Ratings Summary

C.1 Performance Rating by ICR

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

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

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

Overall Bank Performance:	Moderately Unsatisfactory	**Overall Borrower Performance:**	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators

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

D. Sector and Theme Codes

	Original	Actual
Major Sector/Sector		
Public Administration		
Sub-National Government	5	5
Central Government (Central Agencies)	3	3
Social Protection		
Social Protection	1	1
Water, Sanitation and Waste Management		
Water Supply	91	91

Major Theme/Theme/Sub Theme		
Private Sector Development		
Business Enabling Environment	40	40
Investment and Business Climate	40	40
Regulation and Competition Policy	20	20
Urban and Rural Development		
Urban Development	40	40
Services and Housing for the Poor	40	40

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Gobind T. Nankani
Country Director:	Rachid Benmessaoud	Hafez M. H. Ghanem
Practice Manager/Manager:	Maria Angelica Sotomayor Araujo	Michel Wormser
Project Team Leader:	Camilo Lombana Cordoba	Alexander A. McPhail
ICR Team Leader:	Maximilian Leo Hirn	
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F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The Project's principal development objectives are to: (i) improve reliability of water supply produced by the water treatment works in Lagos; (ii) increase access to piped water networks in four cities in Cross River State; and (iii) improve commercial viability of the urban water utilities in Cross River and Lagos States.

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

The objectives of the Project are to: (i) improve the reliability of water supply produced in the Participating States; (ii) increase access to piped water networks in Lagos State and in seven cities in Cross River State; and (iii) improve the commercial viability of urban water utilities in the Participating States.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Lagos Treatment Works operate at 85% capacity for 80% of the time-by June 30,2008.			
Value quantitative or Qualitative)	33% / 40%	85% / 80%	85% / -	81.3%
Date achieved	05/19/2005	06/30/2008	05/31/2016	12/31/2017[1]
Comments (incl. % achievement)	PDO formulation was adjusted to "Lagos Treatment Works operation capacity (water produced / water that would be produced if using the plant at 100%capacity 24/7)". Actual value achieved at final closing date of co-financing represents 96% of target.			
Indicator 2 :	Number of hours of water supply per day in Lagos State			
Value quantitative or Qualitative)	6 hours		18 hours	More than 23 hours
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. Value achieved at final closure constitutes more than 127% of target.			
Indicator 3 :	Number of hours of water supply per day in Calabar / other Cross River State Towns			
Value quantitative or Qualitative)	6 hours / not available		18 hours / 18 hours	19.3 hours / 17.8 hours
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. Target achieved overall - target exceeded in Calabar (107% of target), and nearly achieved in other Cross River State systems (99% of target).			

[1] Closure of IDA project was May 31, 2016. The AFD co-financing closed on December 31, 2017. Due to the joint-results framework, the latter date was thus used for the evaluation of indicators (see Paragraphs 25 and 26)

Indicator 4 :	Number of connections in Cross River State increases from 1,000 to 50,000-by Project end			
Value quantitative or Qualitative)	1000	50,000	75,000	75,271
Date achieved	05/19/2005	06/30/2011	05/31/2016	12/31/2017
Comments (incl. % achievement)	PDO formulation was adjusted to "Number of new active connections in Cross River State attributable to the project". Value at completion achieved 100% of revised target.			
Indicator 5 :	Number of new active connections in Lagos State attributable to the project			
Value quantitative or Qualitative)	0		24,000	26,115
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. Value at completion achieved 109% of target.			
Indicator 6 :	Direct beneficiaries			
Value quantitative or Qualitative)	10,000		990,000	More than 1,000,000
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. At least 100% achieved by project closure.			
Indicator 7 :	Female beneficiaries			
Value quantitative or Qualitative)	50%		50%	50%
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. Reported achievement of indicator is 100% of target.			
Indicator 8 :	90% of Lagos treatment costs recovered from sales to Distribution Operator / 90% of O&M costs recovered from revenue in Calabar-by Project end			
Value quantitative or Qualitative)	20% / 65%	90% / 90%	Dropped / 100%	Dropped / 41.4%
Date achieved	05/19/2005	06/30/2011	05/31/2016	12/31/2017
Comments (incl. % achievement)	First part of indicator dropped at additional financing, second rephrased as "% of O&M costs recovered from revenue in Calabar" with an achievement of 41.4% of target in final year prior to closure.			
Indicator 9 :	% of O&M costs recovered from revenue in Lagos			
Value quantitative or	25%		90%	54.4%

Qualitative)				
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator only introduced at Additional Financing stage. Achievement of 54.4% of O&M cost recovery in final year prior to closure (60% of target).			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	5 Distribution Districts in Lagos are rehabilitated- by Project end.			
Value (quantitative or Qualitative)	0	5	4	4
Date achieved	05/19/2005	06/30/2011	05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator rephrased as "Distribution districts of Lagos for which the network is rehabilitated" at additional financing. Target 100% achieved by closure of project.			
Indicator 2 :	The existing distribution network in Calabar reaches 90% of the city's population-by Project end			
Value (quantitative or Qualitative)	0% (Revised: 20% / 10%)	90%	90% / 90%	54% / 23 %
Date achieved	05/19/2005	06/30/2011	05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator amended at additional financing to: "% of Calabar's / other Cross River State towns' population covered by the distribution network". Achievement of 54% coverage (60% of target) and 23% coverage (26% of target) by project end.			
Indicator 3 :	New piped household water connections that are resulting from the project intervention (number)			
Value (quantitative or Qualitative)	0		55,000	100,386
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator added at additional financing. 183% of target achieved at project closure.			
Indicator 4 :	Piped household water connections affected by rehabilitation works undertaken under the project (number)			
Value (quantitative or Qualitative)	0		44,000	111,092(at least)
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. %	Indicator added at additional financing. Achieved 253% of target value at project closure.			

achievement)				
Indicator 5 :	Number of meters installed			
Value (quantitative or Qualitative)	0		55,000	90,000 (at least)
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator added at additional financing. Achieved at least 163% of target value at project closure.			
Indicator 6 :	1 PS contracts for operation of the treatment works in Lagos - by MTR			
Value (quantitative or Qualitative)	0	1		0
Date achieved	05/19/2005	10/09/2009		12/31/2017
Comments (incl. % achievement)	0% of target achieved. At additional financing the "by MTR" deadline was dropped in favor of the revised project end date.			
Indicator 7 :	PSP model piloted for 1 smaller urban town in Cross River - by MTR			
Value (quantitative or Qualitative)	0	1	Dropped	0 (but dropped)
Date achieved	05/19/2005	10/09/2009	05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator was dropped at additional financing, but would not have been achieved.			
Indicator 8 :	Lagos treatment plants increase capacity from 60 million m3/year to 180m m3/year by project end			
Value (quantitative or Qualitative)	60 m3/year	180 m3/year		200 m3/year
Date achieved	05/19/2005	06/30/2011		12/31/2017
Comments (incl. % achievement)	Original PAD baseline/targets slightly inconsistent. Indicator rephrased to "Lagos treatment plants capacity attributable to the project" at additional financing. At closure, 111% of target achieved.			
Indicator 9 :	MDG tracking system for access to potable water & sanitation established and operational in the FMWR - by MTR			
Value (quantitative or Qualitative)	0	1		1
Date achieved	05/19/2005	10/09/2009		12/31/2017
Comments (incl. % achievement)	100% of target achieved. Indicator deadline extended at additional financing from "by MTR" to extended project end.			
Indicator 10 :	National utility training plan conceived and implemented by project end			
Value	0	1		1

(quantitative or Qualitative)				
Date achieved	05/19/2005	06/30/2011		12/31/2017
Comments (incl. % achievement)	100% of target achieved.			
Indicator 11 :	Billing collection rate of LSWC			
Value (quantitative or Qualitative)	38%		80%	69%
Date achieved	03/30/2012		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator added at additional financing. Achievement of 69% at closure of project represents 86% of target value.			
Indicator 12 :	Billing collection rate of Cross River State Water Board Limited (CRSWBL)			
Value (quantitative or Qualitative)	80%		95%	33%
Date achieved	03/30/2012		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator added at additional financing. Achievement of 33% at closure of (co-)financing represents 35% of target value.			
Indicator 13 :	Water utilities that the project is supporting (number)			
Value (quantitative or Qualitative)	0		6	2
Date achieved	05/19/2005		05/31/2016	12/31/2017
Comments (incl. % achievement)	Indicator added at additional financing. The project only supported two SWAs/utilities, and never intended to support more. It is not clear why this indicator was set to six in the results framework, possibly to capture the number of towns targeted.			
Indicator 14 :	Communications and consumer outreach programs operational in 2 SWAs - by Project End			
Value (quantitative or Qualitative)	0	2	"Yes"	Yes
Date achieved	05/19/2005	06/30/2011	05/31/2016	12/31/2017

G. Ratings of Project Performance in ISRs

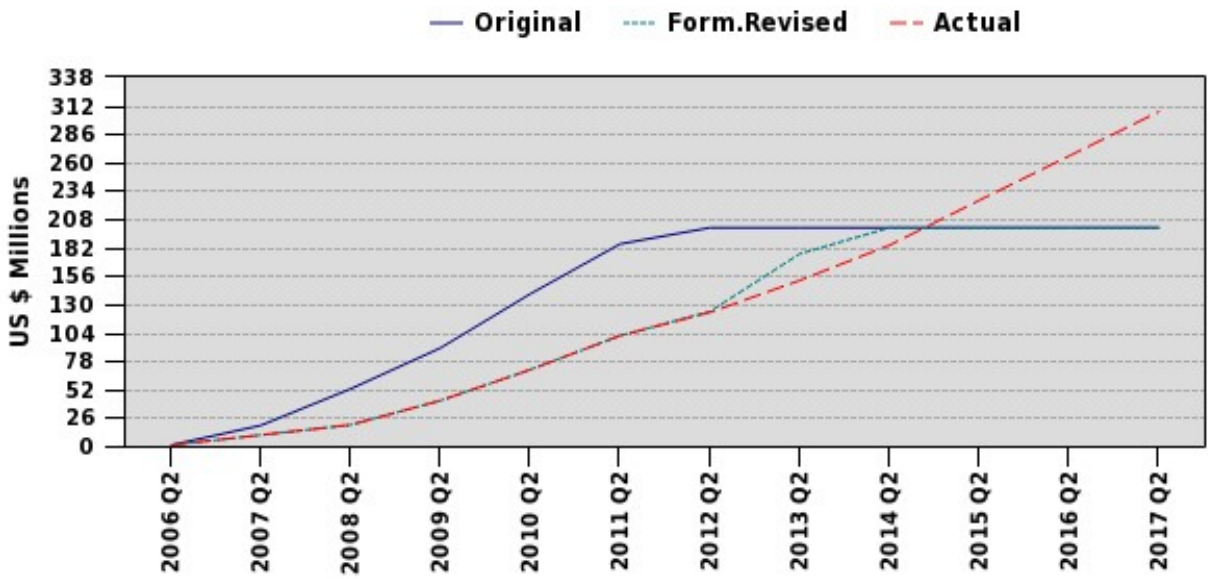
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	12/06/2005	Satisfactory		0.66
2	03/07/2006	Satisfactory	Satisfactory	2.16
3	09/08/2006	Satisfactory	Satisfactory	6.96
4	10/11/2006	Satisfactory	Satisfactory	7.37
5	04/19/2007	Moderately Satisfactory	Moderately Satisfactory	11.79

6	11/27/2007	Moderately Satisfactory	Moderately Satisfactory	17.25
7	05/27/2008	Moderately Satisfactory	Moderately Satisfactory	26.95
8	11/30/2008	Moderately Satisfactory	Moderately Satisfactory	36.83
9	05/21/2009	Satisfactory	Moderately Satisfactory	47.91
10	11/30/2009	Satisfactory	Satisfactory	65.59
11	06/14/2010	Satisfactory	Satisfactory	79.65
12	03/22/2011	Satisfactory	Moderately Satisfactory	104.39
13	12/13/2011	Moderately Satisfactory	Moderately Satisfactory	120.18
14	07/01/2012	Moderately Satisfactory	Moderately Satisfactory	134.86
15	01/14/2013	Moderately Satisfactory	Moderately Satisfactory	151.66
16	10/27/2013	Moderately Satisfactory	Moderately Unsatisfactory	173.71
17	05/17/2014	Moderately Unsatisfactory	Moderately Unsatisfactory	194.53
18	12/25/2014	Moderately Unsatisfactory	Moderately Unsatisfactory	224.75
19	06/14/2015	Moderately Unsatisfactory	Moderately Unsatisfactory	240.12
20	12/30/2015	Moderately Unsatisfactory	Moderately Unsatisfactory	265.83
21	06/30/2016	Moderately Satisfactory	Moderately Satisfactory	301.23

H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
03/31/2011		S	MS	104.39	Extension of the closing date to 31st May 2013, and re-allocation of credit proceeds between categories.
06/19/2012	Y	MS	MS	134.39	Additional Financing to achieve original project targets and expand the project scope with an extended closing date.

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. **At appraisal of the Second National Urban Water Sector Reform Project (NUWSRP2) in 2005, Nigeria was consolidating its transition from military to democratic rule.** Since the end of dictatorship in 1999, two elections had been held and the economy was expanding at an average annual pace of over six percent of GDP per capita, aided by economic reforms and rising oil-prices. Yet despite this political opening and resurgent growth, Africa's most populous nation was still home to more than 70 million poor people and continued to exhibit structural constraints to its socio-economic development.[1] The World Bank diagnosed "a turning point" that "requires a significant, consistent response…if the economy's enormous infrastructure needs are to be met".[2]

2. **Urban water infrastructure had been under particular pressure in the period leading up to NUWSRP2.** Public piped water supply, once the dominant form of provision in Nigeria's cities, had not kept pace with population growth. Between 1990 and 2005, access to piped water dropped from over 63 percent to barely 20 percent as Nigeria's urban population grew by over 25 million.[3] The poor were disproportionately affected by the decline in public water, living in areas with low piped access, and relying on unsafe, expensive sources such as water trucks and wells.

3. **The decline in public water supply was attributed to institutional challenges and an associated lack of investments.** The operational efficiency of State Water Agencies (SWAs), responsible for urban water supply, has been low, marked by political tariff setting, service interruptions, high non-revenue water (NRW) and poor commercial practices. The resulting low cost-recovery led to underfunding of maintenance and capital investments. A lack of appropriate regulation has stifled private investment. In 2005, the investment gap in urban water was US$6.8 billion with an additional US$100 million annual deficit in maintenance (World Bank, 2005).

4. **The higher-level development objectives of the government and World Bank thus stressed not only the importance of better water infrastructure, but a need for sector reform.** The 2004 National Economic Empowerment and Development Strategy (NEEDS) declared water supply "a primary focus", set access targets and called for a "fundamental reorientation" of SWAs and reform of "institutional and regulatory frameworks" towards "more autonomy", "increasing commercialization" and private sector participation (NPC, 2004, p. 64). The World Bank Country Partnership Strategy (CPS) reflected this in its results framework, not only aiming to rehabilitate water infrastructure, but to establish a "model to improve water management" through a focus on "financial sustainability" and "perfecting public-private partnerships" (World Bank, 2005).

5. **The rationale for Bank assistance centered on the promise of NUWSRP2 to deliver on both infrastructure and reform objectives.** The appraisal noted that "major structural reform is needed" and aimed to create a replicable reform model in pilot states combining infrastructure rehabilitation with reforms to improve SWA's operational efficiency and draw in the private sector.[4] The World Bank had a particular ability to lead policy dialogue and make the at-scale, long-term investments needed to achieve significant results using its specialized staff and long experience both in Nigeria's urban water sector and with reforms involving the private sector. NUWSRP2 was preceded by eight Bank water projects in Nigeria and succeeded by NUWSRP3.[5]

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

6. The original credit's PDOs were to "(i) improve the reliability of water supply produced by the water treatment works in Lagos State; (ii) increase access to piped water networks in Cross River State; and (iii) improve the commercial viability of urban water utilities in Participating States."[6]

7. Progress was to be measured by "(i) the increase in operating capacity and hours of operation for the Lagos treatment works; (ii) the increase in the number of connections to the piped water system in Cross River State; and (iii) the degree to which operating costs are recovered from water sales revenues in Cross River and Lagos States" (World Bank, 2005). Details are given in Table 1.

1.3 Revised PDO and Key Indicators, and reasons/justification

8. The original PDO and indicators were revised in the course of an additional financing dated 9th September 2013 and consisting of an additional credit as well as parallel co-financing by the *Agence Française de Développement* (AFD).[7] The updated PDO and indicators captured all activities funded by the World Bank and AFD in a shared results framework, which is also the reason this ICR rates overall outcomes of both IDA and AFD investments under the project.

9. The PDO and key indicators were adjusted to reflect the expanded scope and timeline of the additional financing as well as to correct some original indicators considered to be unclear or incomplete. At the PDO level, the most important changes were the inclusion of Cross River State in the reliability objective (PDO 1) and the extension of the access objective to include Lagos and, explicitly, seven cities in Cross River State (PDO 2).

10. The key indicators were comprehensively revised and expanded from four to nine, simplifying the operational capacity indicator, adding an indicator for connections in Lagos and for reliability of supply, including new Bank core indicators and dropping one due to a change in project design. Aside from the dropped indicator, targets were generally made more ambitious in line with added financing. Table 1 gives a detailed overview of original and revised PDOs and key indicators.

1.4 Main Beneficiaries

11. **The main beneficiaries of this project were the target populations in Lagos and Cross River states.** These were to obtain new access to piped water and more reliable service with better water quality due to the infrastructure and operational improvements funded by the project. At appraisal the number of beneficiaries was implicit in the objectives to increase water production, rehabilitate distribution and add connections. At additional financing these targets were expanded and the targeted number of beneficiaries was explicitly specified to be 990,000 (Table 1 and 2).

12. **At state level the implementing agencies, that is, the Lagos State Water Corporation (LSWC) and Cross River State Water Board Limited (CRSWBL), were also to benefit.** These were to receive extensive support for training, capacity building, Project Implementation Units (PIUs), improved operational systems (e.g. asset register, IT updates) and by way of rehabilitated infrastructure expected to improve production, cost recovery and thus financial independence.

13. **At national level, the Federal Ministry of Water Resources (FMWR), as the executing agency of the federal component, was also to benefit**, through support to a PIU, equipment and staff training, as well as financing for institutional development and policy reform tasks.

1.5 Original Components

14. **Component 1 - Rehabilitation and Network Expansion (US$155.55 million):** This component focused on civil works and funded the restoration of treatment plants and the distribution network in Lagos. In Cross-River state, the aim was to significantly increase metered connections in Calabar city, where production capacity exceeded demand from connected customers. Moreover, component 1 was to fund the rehabilitation of the water systems in the towns of Ikom, Ogoja and Obudu, as well as assessments and civil works to ensure safety of dams in Cross River.

Table 1: Original and Revised Project Development Objectives and PDO Indicators, and outcome values at closure of IDA credits

Original PDOs (IDA, 2005, p. 26)	**Original PDO Indicators** (World Bank, 2005, p. 20)			**Revised PDOs** (IDA, 2013, p. 6)	**Revised PDO Indicators** (World Bank, 2012, pp. 20-24)			**Value at Evaluation**
	Description	**Base**	**Target**		**Revised Description**	**Revised Base**	**Revised Target**	
1. Improve the reliability of water supply produced by the water treatment works in Lagos State	(1a) Lagos Treatment Works operate at 85% capacity for 80% of the time-by June 30,2008.[8]	33% / 40%	85% / 80%	Revised 1. Improve the reliability of water supply produced in the Participating States	Revised (1a) Lagos Treatment Works operation capacity (water produced / water that would be produced if using the plant at 100% capacity 24/7)	Revised[9] 33% / -	Revised 85% / -	81.3% [46]
					New (1b) Number of hours of water supply per day in Lagos State	New 6	New 18	> 23
					New (1c) Number of hours of water supply per day in Calabar / other Cross River State Towns	New 6 / NA	New 18/18	19.3 / 17.8
2. Increase access to piped water networks in Cross River State	(2a) Number of connections in Cross River State increases from 1,000 to 50,000-by Project end.	1000	50,000	Revised 2. Increase access to piped water networks in Lagos State and in seven cities in Cross River State	Revised: (2a) Number of new active connections in Cross River State attributable to the project	Identical 1000	Revised 75,000	75,271 [54]
					New (2b) Number of new active connections in Lagos State attributable to the project	New 0	New 24,000	26, 115 [55]
					New (2c) Direct beneficiaries	New 10,000	New 990,000	>1.000.000 [56]
					New (2d) Female beneficiaries	New 50%	New 50%	50%
3. Improve the commercial viability of urban water utilities in Participating States	(3a) 100% of Lagos treatment costs recovered from sales to Distribution Operator.	20%	*90% [sic][10]*	Identical 3. Improve the commercial viability of urban water utilities in the Participating States.	*Dropped first part of original indicator* *(3a) "100% of Lagos treatment costs recovered from sales to Distribution Operator."*	*Dropped*	*Dropped*	*Dropped, but did not occur / not achieved*
	(3b) 100% of O&M costs recovered from revenue in Calabar-by Project end.	65%	*90% [sic]*		Revised (3b) % of O&M costs recovered from revenue in Calabar	Revised 55%	Revised 100%	41.4% [73.8% with salary subsidies][58]
					New (3c) % of O&M costs recovered from revenue in Lagos	New 25%	New 90%	54.4% [74.3% with salary subsidies][61]

15. **Component 2 - Public-Private Sector Partnership (PSP) Development (US$7.45 million):** For (i) support to the tendering process for a PSP to advise on and subsequently operate the rehabilitated Lagos treatment works; (ii) the establishment of help-desks to support the private operators (POs) expected to operate LSWC's distribution system; (iii) the majority of fees for the PO of the Lagos treatment works, and a provision for a PO expected to manage one secondary-town system in Cross-River; (iv) technical and financial auditors to certify PO performance.

16. **Component 3 - Service Sustainability and Project Management (US$14.55 million):** This component funded key project expenses, in particular (i) operating costs for PIUs; (ii) office equipment, cars and trucks for the utilities; (iii) subsidies for electricity, chemicals and diesel until the utilities in both cities can be self-financing following improvements in water production (in Lagos) and customer base (in Cross River); and (iv) funding for customer outreach.

17. **Component 4 - Policy Reform and Institutional Development (US$10.95 million):** This component was to finance technical assistance to the utilities and FMWR on management, commercial and technical issues, establish and support a regulator in Lagos, studies on a regulatory framework in Cross River, as well as a national utility training program. The component was also to fund a national system to track progress towards the Millennium Development Goals (MDGs).

18. Progress was originally to be tracked by eight intermediate results indicators (Table 2).

1.6 Revised Components

19. The additional financing retained the four original components, but significantly changed their funding, scope, geographic focus, timeline and thus intermediate results indicators (Table 2).

20. **Revised Component 1 (110% increase to US$327.25 million, of which US$75.7 million AFD co-financing):** Additional funding was required to compensate for excess costs of US$ 66.7 million in the cities of Ikom and Ogoja, as well as for added works in Itigidi, Obubra and Okpoma in Cross River, thus expanding geographic scope. Additional allocations were made to fund the rehabilitation of two distribution districts in Lagos, reducing the original target from five to four.

21. **Revised Component 2 (67% increase to US$12.45 million, of which none from AFD):** The original intermediate result target of piloting a PSP model in one secondary city in Cross River was dropped, while the second target of a private sector contract for the Lagos treatment works was retained in revised form and with additional funding to achieve it by the new closing date. [11]

22. **Revised Component 3 (28% increase to US$18.55 million, of which none from AFD):** Only minor revisions in wording were made to results indicators under this component, but additional funds were made available for PIU operating costs, IT equipment and trainings.

23. **Revised Component 4 (155% increase to US$27.95 million, of which US$2 million from AFD):** Significant additional funds were made available to achieve the MDG tracking system, additional support to LSWC and new studies on water governance and investment planning in selected states.

1.7 Other significant changes

24. **Implementation Arrangements:** The World Bank, through its International Development Association (IDA), and AFD entered into a parallel co-financing agreement on March 20, 2013. In a fee-for-services arrangement, IDA agreed to manage the project including the AFD co-financed activities in accordance with IDA's policies and procedures. While the World Bank thus continued to manage the project under IDA rules, some procedures became more complex as AFD joined as

a financing partner (e.g. reporting, disbursement administration). The borrower's implementation arrangements were not changed and the results framework was not separated by funding source.

25. **Timeline:** The closing date of the original credit (4086) was first extended in 2011, from June 30, 2011 to May 31, 2013.[12] At additional financing, the new IDA project closing date was set as May 31, 2016. The AFD co-financing credit (CNG1007 01) originally had a closing date of November 30th, 2016, but this was subsequently extended to December 31, 2017.

26. The delivery date of this Implementation Completion Report (ICR) was first extended by six months to May 30, 2017, and subsequently to May 30, 2018, in order to allow a better evaluation of the joint results-framework given that AFD financing only concluded on December 31, 2017.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

27. **An initial project concept review took place in 2001, but preparation only started after renewed government interest in July 2004.** Cross River state was added to the project relatively late, a few months before the decision meeting and negotiations in March 2005, and Board approval in July 2005. The project's strategic analysis of sector challenges was adequate and the government's initial commitment strong, but quality at entry suffered from the paucity of baseline data, a lack of specific reform objectives, and the underestimation of the severity of identified risks, and thus unrealistic expectations about the project's timeline and financial viability.

28. **The project's analysis contained an adequate assessment of the strategic sector challenges and a sensible overall strategy incorporating some lessons from earlier operations**. Given high investment deficits and widespread utility underperformance, the strategy to concentrate scarce resources on two relatively well-performing states to create replicable reform models was well justified and a clear lesson from earlier projects.[13] The project correctly identified not just policy reform, but improvements in utility operations as critical to make infrastructure investments sustainable. Although ultimately unsuccessful, the ambition to draw in private participation was justified given disappointing results in earlier projects more focused on public sector strengthening.

29. **A wide range of stakeholders were consulted during preparation and government buy-in was initially strong.** Numerous NGOs were met in both states to explain project objectives. A communications audit and media campaign was undertaken to allay concerns about PSP.[14] Government strongly supported the project and pledged US$10.5 million in counterpart funds.

30. **The scope of the project was sufficient to significantly impact identified sector challenges.** The investments planned at appraisal addressed the key service bottlenecks in the selected sites, specifically, the lack of production capacity in Lagos and the inadequate size of the distribution network in Calabar. Moreover, given the size and economic importance of Lagos, a successful reform model would have set an example for other urban areas of Nigeria.

31. **While problem analysis and stakeholder engagement were adequate, project design suffered from limited baseline data and struggled to formulate an effective reform response.** The widely professed need for policy and institutional reform to achieve the project objectives was not translated into a clear roadmap for such reforms (e.g. operational efficiency gains; PSP regulation, tariff autonomy). This is reflected in the near absence of reform-related indicators in the results matrix (Section 2.3.1). Moreover, the paucity of baseline data led to unrealistic targets, and under-estimation of funding needs which had to be corrected at additional financing. This was noted at mid-term review which was critical of the quality of appraisal (World Bank, 2010, p. 2).

Table 2: Project Components with Original and Revised Intermediate Results Indicators, and outcome values at closure of IDA credits[15]

Project Components	Original Intermediate Results Indicators (PAD 2005, pp.21-22)	PAD Base	PAD Target (2011)	Revised Intermediate Results Indicators (AF Project Paper 2012, pp.25-27)	Revised Base	Revised Target (2016)	Value at Evaluation	Revised Component Allocation[16]
Component 1: Rehabilitation and Network Expansion	(1a) 5 Distribution Districts in Lagos are rehabilitated- by Project end.	n/a (i.e. 0)	5	Revised (1a) Distribution districts of Lagos for which the network is rehabilitated	Identical 0	Revised 4	4 [17]	$327.25m (of which $75.7m from AFD)
	(1b) The existing distribution network in Calabar reaches 90% of the city's population-by Project end.	0%	90%	Revised (1b) % of Calabar's / other Cross River State towns' population covered by the distribution network	Revised 20%/10 %	Revised 90%/90%	54 % / 23% [18]	
				`New: (1c) New piped household water connections that are resulting from the project intervention (number)	New 0	New 55,000 [19]	100,386 [20]	
				New: (1d) Piped household water connections affected by rehabilitation works undertaken under the project (number)	New 0	New 44,000	111,092[21]	
				New (1e) Number of meters installed	New 0	New 55,000	> 90,000 [22]	
Component 2: Public-Private Partnership Development	(2a) 1 PS contracts for operation of the treatment works in Lagos - by MTR	0	1	Revised (Time Extension) (2a) PS contracts for operation of the treatment works in Lagos	Identical 0	Identical 1	0	$12.45m (none of which from AFD)
	(2b) PSP model piloted for 1 smaller urban town in Cross River – by MTR	0	1	Dropped (2b)	Dropped	Dropped	Dropped, but not achieved	
Component 3: Service Sustainability & Project Management	(3a) Lagos treatment plants increase capacity from 60 million m3/year to 180m m3/year by project end	60m m3/y [23]	180m m3/y [23]	Revised (3a) Lagos treatment plants capacity attributable to the project	Identical 60m m3/y	Identical 180m m3/y	200 m3/y [24]	$18.55m (none of which from AFD)
	(3b) Communications and consumer outreach programs operational in 2 SWAs – by Project End	n/a (i.e. 0)	2	Identical (Rephrased) (3b) Communications and consumer outreach programs operational in Cross River and Lagos	Identical No	Identical Yes	Yes [25]	
Component 4: Institutional Development & Policy Reform	(4a) MDG tracking system for access to potable water & sanitation established and operational in the FMWR – by MTR	0%	100%	Revised (Time Extension) (4a) MDG tracking system for access to potable water & sanitation established and operational in the FMWR	Identical 0	Identical 1	1 [26]	$27.95m (of which $2m from AFD)
	(4b) National utility training plan conceived and implemented by project end	0%	100%	Revised (Time Extension) (4b) National utility training plan conceived and implemented	Identical No	Identical Yes	Yes [27]	
	-			New: Billing collection rate of LSWC	New: 38%	New: 80%	69% [28]	
				New: Billing collection rate of Cross River State Water Board Limited (CRSWBL)	New 80%	New 95%	33% [29]	
				New: Water utilities that the project is supporting (number)	New: 0	New: 6	2 [30]	

32. **Key risks were correctly identified at entry, but their severity was under-estimated.** The only risk rated "substantial" at appraisal was availability of electricity, which indeed was to pose a major challenge in the achievement of PDO indicators (Section 3.2). Risks relating to reform objectives, in particular, lack of utility autonomy and hesitancy by the private sector to engage, were rated "moderate", but turned out to be more severe than expected as neither autonomy nor private participation was achieved. The complexity of factors opposing policy reform and a successful PSP – including the underdeveloped legal framework, infrastructure delays, lack of interest by POs for marginal systems, resistance from public-sector unions, opposition by NGOs and a resulting lack of political commitment – was not sufficiently understood or mitigated. The other two risks identified at entry – civil works delays and financial management risks – were also rated "moderate", but also led to substantial issues (see Sections 2.2 and 2.4).

33. **Reform and risk-related challenges had a significant impact on the project's financial viability.** Delayed completion of infrastructure, challenges in maintaining production, insufficient gains in operational efficiency and political constraints on tariff increases undermined the financial benefits expected at entry and left ambitious cost-recovery targets out of reach (Section 3.3.3).

2.2 Implementation

34. **Implementation progress ratings trended downwards from satisfactory to moderately unsatisfactory over the course of the IDA project (Annex 9), but implementation improved significantly in the final 18 months of the project.** Implementation was delayed, more expensive, and, with respect to reform related targets such as private sector participation and cost-recovery, less impactful than originally expected. However, at least in the implementation of infrastructure works, the project overcame earlier challenges through a determined effort in the final project phase and achieved or nearly achieved PDO targets related to access and supply reliability (see Table 1). Due to the closure of the IDA component, no Implementation Status Reports (ISRs) were filed in this final phase from mid-2016 to December 2017, but improvements were captured in Aide-Memoires and certificates of completion by supervisory firms hired by the project.[31]

35. **NUWSRP2 was implemented at both Federal and State level.** A Federal Project Implementation Unit (FPIU) was responsible for overall oversight, dam related tasks, national policy reform and overall training, a water resources management initiative and the MDG tracking system. State Project Implementation Units (SPIUs) managed the implementation of the state-level components, that is, the bulk of infrastructure works and tasks such as the attempted PSP. The SPIUs were primarily staffed with utility employees thus promoting long-term capacity building.

36. **Due to the late availability of feasibility studies, SPIU capacity constraints, staff turnover and political-economic challenges, implementation had been delayed by nearly a year in 2007, causing a downgrade to "moderately satisfactory".** Although a Project Preparation Facility of US$ 2m was in operation by late 2004 (World Bank, 2014), detailed feasibility studies only became available well into the project. For instance, final studies for Cross-River were only received in November 2006, and significant works did not start before 2008. Shortly before mid-term review, the Bank noted that "disbursements of 24% are low considering the project time elapsed" (World Bank, 2009). Targeted interventions in Ikom, Ogoja and three service areas in Lagos could not be processed under the original credit due to excess costs. [32]

37. **Planning issues were aggravated by procurement delays as SPIUs at first struggled to conform with World Bank standards** (see Section 2.4). In 2007 a World Bank supervision mission noted that "procurement is not moving well in either state" (World Bank, 2007). The initial

capacity constraint was due to understaffing, lack of training and basic technical challenges such as a lack of internet connectivity (World Bank, 2006, pp. 3-4). SPIU capacity was also undermined by staff turnover which the Borrower Completion Report (BCR) noted "remained a big issue throughout the project" creating "instability in project management" (VIPCG, 2016, pp. 99-102).[33] Political changes over the project duration (three Governors in Cross River, three Governors in Lagos, and three national presidents) contributed to staff turnover and also led to other constraints, such as changing bureaucratic procedures causing disbursement delays (Section 2.4).

38. **The mid-term review in October 2009 focused on actions to boost the pace of implementation.** Exhortations for PIUs to be "more proactive in the project implementation" were combined with specific planned actions such as improving the "communication gap between the states and the Federal PIU", a workshop to accelerate the PSP component, a re-allocation of original funds and early planning for additional financing (World Bank, 2010).

39. **Implementation of infrastructure progressed better following additional financing, but still fell short of most access and supply reliability targets in mid-2016.** The additional financing in 2013 had augmented the original credit (4086) of SDR 132.7 million (US$ 200 million equivalent) by an IDA credit (5129) of SDR77.5 million (US$120 million equivalent) with parallel co-financing of US$77.73 million by AFD (CNG1007 01). Implementation of infrastructure was buoyed by more adequate funding, better planning documents, increasing experience of PIUs, and a relatively stable macro-environment. Nevertheless, in May 2016, the majority of PDO targets had been missed[71], not least due to a difficult period in 2015-16 marked by energy shortages, maintenance issues, incomplete works and disruptions due management changes (see Section 3).

40. **In the final project phase, a greatly improved, pro-active implementation performance led to the nearly full achievement of infrastructure related targets.** Driven by an intensive supervision effort of a new Bank task leader, amendment of contracts to improve outcomes (e.g. more connections, see Section 3.2), new commitment by the government (as shown e.g. by payment of energy bills) and more efficient procurement performance by the PIUs, PDO targets relating to supply reliability and access were achieved or nearly achieved by final closure in December 2017 (see Table 1). This commendable turn-around with respect to access and reliability PDOs leaves the project in a significantly better state than it was just 18 months prior to closure.

41. **By contrast, non-infrastructure components continued to struggle and PSP and commercial viability targets remained out of reach.** In May 2014 the overall project progress indicator was downgraded to "moderately unsatisfactory" due to a lack of progress on commercial viability and PSP targets (World Bank, 2014). The lack of a clear roadmap for improving commercial operations and waning political commitment to the privatization approach undermined implementation of the project's nominal reform agenda. At restructuring, the PSP related PDO indicator was dropped, though the project lacked the foresight to also adjust its cost-recovery PDO target to more realistic levels. In the final project phase following closure of IDA financing, externally supported performance improvement programs made some progress in addressing the entrenched issues with metering and billing in both utilities, achieving a turnaround in trend, though still falling far short of commercial viability targets (see Section 3.2).

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

2.3.1 M&E Design

42. **The M&E design set adequate indicators to monitor progress towards improving water supply reliability, access and commercial viability.** This is particularly true after a revision at

additional financing which clarified, corrected and extended the original indicators to measure PDOs across both states more precisely.[34] Reliability was measured not just by realized plant capacity but hours of supply; access extension not just by new active connections, but also overall beneficiaries; cost-recovery and bill collection captured two key aspects of commercial viability gains made possible by higher capacity and new connections (Tables 1 and 2).

43. **The M&E design, however, was weak with respect to reform targets.** The results framework contained no PDO reform indicators, despite the appraisal's "clear conclusion that major structural reform is needed" and that the "government is thus seeking to provide replicable models for other reform minded states" (World Bank, 2005). The project did include a "Component 4: Institutional Development & Policy Reform", but no associated PDO level indicators, and related output indicators also did not target specific reforms. There were no indicators for two policy improvements the project did achieve, that is, the establishment of a regulatory institution in Lagos and development of a water resources policy – a missed opportunity for formally recognizing project achievements. More generally, the absence of reform targets in a project named "Second National Urban Water Sector *Reform* Project" weakened the intervention's focus on and direction for reforms which could have supported its ultimate objectives.

44. **The M&E design would also have benefited from a more precise, qualitative formulation of institutional development targets.** Indicators for key tasks – in particular, the implementation of a "national utility training plan", "communications and consumer outreach programs" and "MDG tracking system" – were binary (i.e. achieved or not achieved). Monitoring of *quality* of outputs (e.g. how many utility staff were trained; how was consumer outreach improved etc.) was lacking. For example, the MDG tracking system was formally established and is operational, though its longer-term purpose and sustainability remains uncertain (see Annex 2 for details).

45. **The institutional design of project M&E was fair overall and well-funded by Component 3, though its multi-tier structure made it vulnerable to communication and supervision gaps.** The FPIU was responsible for overall project M&E while local supervision was devolved to the SPIUs which in turn sourced data from technical units within the utilities. Monitoring of financial aspects also involved the Project Financial Management Units (PFMU), which in Lagos were part of the Finance and Accounts Department of LSWC and in Cross River State located in the State Accountant General's office (World Bank, 2005). The resulting multi-tier structure reasonably devolved M&E to implementation level, but also made it reliant on clear communication and local quality control as the Abuja based FPIU could not systematically verify progress independently.

2.3.2 M&E Implementation

46. **The quality of the implementation of M&E was modest.** The strong reliance on the SPIUs and utilities for data gathering proved a source of weakness. As the BCR noted, SPIUs initially considered M&E as less important and more of a threat than an opportunity (VIPCG, 2016, p. 71). The FPIU in Abuja was generally too remote to verify field reports. The mid-term review noted the "need for the FPIU to put in place a robust M & E strategy" (World Bank, 2010), but even after additional financing M&E was "not being followed up on as and when it is required" and the M&E rating was temporarily downgraded to "Moderately Unsatisfactory" (World Bank, 2013).

47. **Steps to improve M&E were taken in the final years of the project, but key M&E data remained unclear and even contradictory for most of the project.**[35] To improve M&E the FPIU facilitated trainings and in 2016 put in place an online M&E platform for SPIUs to upload and track M&E data (World Bank, 2016, p. 18) though even at project end, data was typically shared in an ad-hoc manner. Obtaining reliable, unambiguous and well-documented M&E data remained

a challenge, which hindered a clear understanding of progress during much of the project and necessitated considerable effort at ICR stage to verify final outcomes (see Endnote 35).

2.3.3 M&E Utilization

48. **The utilization of M&E was limited initially, but did positively inform decision making in the project's final phase as well as provide information for follow-up analyses.** In the first phase of the project, M&E data was not utilized very effectively, as illustrated by the missed opportunity of adjusting cost recovery targets to realistic levels during restructuring (Section 5.1). Although M&E data remained imperfect (Section 2.3.2 and Endnote 35), the eventual recognition of significant shortfalls in objectives did play a key role in motivating and directing the improved implementation performance of the final project phase, which led to the achievement of infrastructure objectives (Sections 2.2 and 5.1(b)).

49. Data generated by the project's MDG tracking system was also used in the World Bank funded Nigeria WASH Poverty Diagnostics (P158634) and Review of Rural Water Supply and Sanitation Sector in Nigeria (P165662).

2.4 Safeguard and Fiduciary Compliance

50. **Safeguard compliance was moderately satisfactory.** The environmental category of original and additional financing was Category B. Safeguard policies triggered were Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (4.12), Safety of Dams (4.37) and Projects on International Waterways (7.50) and also applied to the tasks co-financed by AFD. The major required safeguard documents were compiled, approved and disclosed in time and no major violations are on record. Notable efforts at stakeholder engagement were undertaken through radio and television, the creation of helpdesks and civil-society driven community campaigns.

51. **Environment Assessment (OP/BP 4.01).** The project prepared and disclosed a project level Environmental and Social Management Framework (ESMF) in 2005, as well as subsequent site specific Environmental and Social Impact Assessments (ESIAs). Compliance has been moderately satisfactory as there were no major safeguards violations as documented in the ISRs (Annex 9). However, some delays and inconsistencies in the preparation, disclosure and compliance with site specific safeguard measures were noted by World Bank missions (World Bank, 2015, pp. 28-33) and the BCR (VIPCG, 2016, p. 93). Such issues were partly due to the lack of a dedicated safeguards officer in Cross River and Lagos for significant periods leading the BCR to conclude that "the impact of the [safeguards] function has not been significantly felt" and "documentation of safeguards implementation activities was weak" (VIPCG, 2016, p. 62; p.105).

52. **Involuntary Resettlement (4.12).** A Resettlement Policy Framework (RPF) was prepared in and disclosed in 2005, followed by site specific Resettlement Action plans (for the additional sites after restructuring in March 2012). Delays in payments to Project Affected People in Lagos led to a brief suspension of works in February 2017, but this was quickly resolved by April 2017.

53. **Safety of Dams (4.37).** A Dam Safety Report completed and disclosed in May 2005 and a Dam Safety and Remedial Study completed in July 2006 for the project financed Obudu Dam. No irregularities or violations were recorded by the project M&E and safeguards documentation.

54. **Projects on International Waterways (7.50).** A formal riparian notification under OP/BP 7.50 was sent to the Government of Cameroon in March 2005 as required.

55. **Procurement functions were moderately unsatisfactory overall.** While the FPIU performed well, state-level procurement was cited as a key source of implementation delay in early Aide-Memoirs (World Bank, 2006) and the "poor quality of bidding documents and evaluation reports" was noted at mid-term (World Bank, 2010). The credit funded procurement trainings, but high staff turnover undermined such capacity building. Supervision missions persistently flagged issues such as unretired advances, inadequate documentation and unavailable payment vouchers, in particular in Lagos (World Bank, 2016, p. 15) (World Bank, 2016, p. 28) (VIPCG, 2016, p. 65). Such problems were likely aggravated by the lack of a computerized accounting system to minimize human error –at FPIU level until 2015 and in Lagos until IDA project closure. No fraud or corruption issues were identified during the project.[36] Procurement performance improved in the final phase of the project, contributing to the turn-around in key indicators (Section 3.2).

56. **Financial management was moderately unsatisfactory overall.** The last financial management supervision reports noted that project activities were generally based on approved work plans, books and records were up to date, that audit quality had improved by project end and that project closure related activities were being implemented satisfactorily (World Bank, 2016, p. 3) (World Bank, 2016b, p. 2). However, the project has not been without financial management challenges, including delayed or low-quality audits[37], error-prone and delayed payment processing, and a shortfall in counterpart funds. Moreover, the project over-committed funds, and expenditures in excess of USD200,000 had to be declared ineligible for financing from the World Bank credits and the government has been asked for a refund (World Bank, 2018).[38]

2.5 Post-completion Operation/Next Phase

57. **At federal level the FPIU will remain in place post-completion to manage the successor project NUSWRP3 (targeting other states), while SPIUs will be absorbed by the state utilities.** The continuance of the FPIU under NUSWRP3 is an opportunity to pursue national reform efforts attempted by NUSWRP2 such as regulatory development, water resources legislation and the MDG tracking system. As the SPIU members were utility staff, a smooth re-absorption is expected.

58. **The NUWSRP3 follow-up project has benefited from and been informed by NUWSRP2.** The FPIU of NUWSRP3 benefited from extensive capacity building under NUWSRP2. Although the NUSWSRP2 states are not targeted by the successor project, NUWSRP3 states have benefited from action plans, guidelines on sector regulation, financial modeling and the national utility training plan developed under NUSWRP2. Considering the unsatisfactory results on private-sector participation under NUSWRP2, the results framework of the successor project does not include PSP targets. Data collected during NUWSRP2 was used in the Nigeria WASH Poverty Diagnostic. Notably, participation of AFD as co-financer in NUWSRP2 led to its further engagement in urban water in Nigeria in Ogun as well as interventions in the states of Plateau, Ondo, Enugu and Kano.

59. **Beyond Nigeria, the co-financing arrangement of NUWSRP2 has inspired a similar cooperation between the World Bank and AFD in Angola (P151224).** The NUWSRP2 may thus be seen as a model for the World Bank leveraging its resources through substantial co-financing and the provision of fees-based services in project management.

3. Assessment of Outcomes

60. As the PDOs of NUWSRP2 were formally revised, outcomes are assessed against both the original and revised objectives. In light of the reviewed evidence, and as the additional financing did not significantly amend the PDO beyond expanding its geographic scope, as well as specifying

and scaling-up associated indicators, most pre- and post-revision ratings have been found to coincide as outlined below.[39] An overview of the ratings is given in Table 5.

3.1 Relevance of Objectives, Design and Implementation

3.1.1 Relevance of Objectives: Substantial (Pre- and post-restructuring)

61. **The Project Development Objectives remain substantially relevant for Nigeria's development objectives.** Nigeria's economic development strategy Vision 2020 highlights "sustainable access to potable water" as a basic objective and calls for "key initiatives" including "rehabilitating, constructing and modernizing existing water supply and sanitation schemes, distribution networks and facilities for optimal operation" (NPC, 2009). This prioritization echoes Nigeria's NEEDS strategy at project start. Both original and revised PDOs directly reflect this strategy of extending access and optimizing operations.[40]

62. **The original and revised PDOs are substantially consistent with the World Bank's latest Country Partnership Strategy (CPS) for fiscal years 2014-17/19.[41]** The CPS results matrix lists "coverage and efficiency of water supply services" as a key engagement area and cites "improved coverage and efficiency of water supply service in selected states" as a targeted CPS outcome. The CPS highlights the "lack of financial autonomy" as at "the heart of the poor performance of all water utilities", notes the "still unreliable and…poor quality" services as a key development challenge, and proposes the number "of people with access to improved water supply" and an increase in "cost recovery for operation and maintenance" as specific indicators (World Bank, 2014, pp. 36; pp.58-9). The original and revised PDOs aimed at improving reliability of supply (PDO 1), access to improved water (PDO 2) and commercial viability of utilities (PDO 3), as well as NUWSRP's strategic focus on selected states, are thus fully in line with the CPS.[42]

63. **The PDOs are substantially aligned with the Bank's goal of ending extreme poverty and promoting shared prosperity.** The utility-reform focused approach in Lagos could be reasonably expected to improve supply to the poor[43], and in Cross River, the results framework includes a near-universal (90%) access target that makes this ambition explicit (Table 2).

3.1.2 Relevance of Design and Implementation: Modest (Pre- and post-restructuring)

64. **The project design clearly linking PDOs to intermediate infrastructure outputs and capacity building activities to achieve them.** The causal chain between funding and final outcomes was well established and not diluted by irrelevant or extraneous activities. The objective to "improve the reliability of water supply" (PDO1), "increase access to piped water networks" (PDO2) and "improve commercial viability" (PDO3) were prioritized through important infrastructure investments by Component 1 which was allocated nearly 75% of original funds and more than 80% of additional financing. The infrastructure improvements were a necessary activity to achieve PDO targets (e.g. by increasing water available for sale). Activities foreseen under Components 2-4 were also consistent with the PDOs, supporting attempts to achieve targeted outcomes through consumer outreach, better data, utility training, and the involvement of the private sector, though the latter core element ultimately had to be abandoned (see Tables 1 and 2).

65. **The design and implementation of the project, however, was relatively weak in terms of sector reform, which undermined the achievement of key stated project objectives.** While the importance of sector reforms to achieve more reliable, accessible and commercially viable water supply is emphasized in the appraisal, the CPS and the government's NEEDS strategy (World Bank, 2014, p. 22; p.36) (NPC, 2004, p. 64)[44], and explicit in the name of this National Urban

Water Sector "Reform" project, the design contained no effective sector reform agenda. There was a lack of realistic intermediate reform targets (e.g. an adequate policy on PSPs, or utility autonomy) linked to overall project objectives (e.g. commercial viability). Private sector participation, as designed, turned out not to be an effective, politically viable strategy in the given sector context, and associated targets were either dropped at restructuring or missed.[45] Other reforms such as utility autonomy over tariffs, though emphasized as important at appraisal (World Bank, 2005, p. 1), found no political support and were not effectively realized. An approach to cost recovery that relied on "regular tariff increases after the year 2010" (World Bank, 2005, p. 53) was thus not successful. Indeed, the demanding commercial viability targets and ineffective approach to PSP and tariff autonomy may even have distracted from an earlier and potentially more productive direct focus on operational efficiency gains as undertaken in the final project phase.

66. **In the final phase, the project sought to compensate for a lack of sector reforms with capacity building measures, but these efforts ultimately fell short in key respects.** Capacity building measures aimed to deliver objectives within the existing institutional set-up. This included extensive support for externally guided performance improvement programs and management advice, new metering and billing systems, a tariff study and the creation of a regulatory institution in Lagos. Though reversing a negative trend, these late efforts unfortunately fell short of making a decisive difference to achievement of the commercial viability objective (Section 3.2.3).

67. **The Modest rating for Relevance of Design and Implementation thus reflects the failure of the project to live up to its ambition of effective sector reform and financial autonomy.** According to the most recent Nigeria CPS, the continued lack of financial autonomy is "at the heart of the poor performance of all water utilities" (World Bank, 2014, p. 36). Design and implementation fell short insofar as the chosen approach to sector reform was inconsistent with achieving stated project objectives in this respect, especially the missed commercial viability PDO 3 (see Section 3.2). The continued lack of commercial viability at project closure, in turn, poses substantial risks to the other development outcomes (see Section 4).

3.2 Efficacy - Achievement of Project Development Objectives

Efficacy Rating: Substantial (Pre- and post-restructuring)

68. **The efficacy rating for the achievement of PDO pre- and post-restructuring is *Substantial***. The Substantial rating recognizes that the operation successfully completed major infrastructure works, greatly improving supply capacity and reliability in line with the first and second PDOs. This is a significant achievement that benefited more than a million Nigerians. The project fell short of achieving the third PDO on cost recovery and dropped PDO level PSP targets, a shortcoming that occurred in the context of partly exogenous political decisions on subsidy-, tariff- and PSP policies and the impact of political instability on energy supplies (Section 3.2.3).

69. Specifically, the pre-restructuring rating of Substantial is based on High achievement of the sole original PDO 2 target, which was significantly exceeded, and Substantial achievement of the original PDO 1 target, though achievement of the original PDO 3 on cost-recovery and PSP was negligible. The post-revision rating of Substantial reflects the fact that most objectives and outcomes (i.e. PDO 1 and 2) warrant a Substantial rating even though the PDO 3 was missed. Table 1 gives an overview of PDOs, indicators and outcomes. Further details on the outputs under each component are given in Table 2 and Annex 2.

70. **Ratings are based on M&E data as of the closure of the project on December 31, 2017.** As noted in Section 1.3, the project used a shared results framework for the overlapping activities

financed by the two IDA credits and the AFD co-financing. The final ratings thus assess the total outcomes of the combined IDA and AFD financing for the project at the closure of the latter.

3.2.1 PDO 1 to Improve the Reliability of Water Supply

Overall PDO 1 Rating: Substantial (Pre- and post-restructuring)

71. **The rating for PDO 1 to "improve the reliability of water supply" is rated Substantial pre- and post-restructuring.** In Lagos, the final project month of December 2017 saw the completion of critical repairs that raised realized operation capacity to 81.3% just below the target of 85%.[46] [47] Supply reliability in Lagos reportedly surpassed 23 hours per day on average by the end of 2017, thus significantly exceeding the target of 18 hours. [48] The third PDO 1 indicator targeting 18 hours of water supply in both Calabar and other Cross River State Towns was achieved in Calabar with 19.3 hours, and also effectively achieved in the secondary systems which averaged 17.8 hours of supply (Table 1).[49] Thus, the sole pre-revision indicator, which targeted Lagos, was nearly achieved (within five percent of target), justifying a substantial rating. Post-revision, the substantial achievement of objectives justifies an overall substantial rating.

72. **The (near) achievement of supply reliability targets in Lagos in the final project months was due to a major successful turnaround during the final phase of the project.** In Lagos, the BCR had reported a realized operational capacity of only 35.6 percent and 15 hours of supply in the first quarter of 2016 due to a combination of endogenous factors (e.g. lack of maintenance, vulnerability to shocks due to lack of cost recovery) and exogenous impacts, especially power shortages.[50] These problems were addressed through a number of pro-active measures initiated by the Bank task leader and PIU, in particular intensive additional repair works at key water plants, an externally guided performance improvement program and a restoration of more regular power supply both from Independent Power Plants (IPPs) and grid electricity.[51]

73. **In Cross River state, the outcomes are due both to pro-active steps by the PIU as well as its topographical advantages.** The utility has undertaken pro-active steps to ensure the steady supply of energy in Calabar, specifically by obtaining partial payment of power arrears by the Cross River State Government and agreeing on a payment plan with the power utility PHEDC that allowed reconnection to the grid. The project also funded the repair of electromechanical equipment at the Calabar water treatment plant to relieve constraints on its production capacity.[52] The state also benefits from a natural topography that allows the use of elevated reservoir tanks and gravity in many locations to temporarily supply the network even in case of power outages.

3.2.2 PDO 2 to increase Access to Piped Water Networks

Overall PDO 2 Rating: Substantial Pre-restructuring: High Post-Revision: Substantial

74. **The second PDO to "increase access to piped water networks" is rated High pre-restructuring and Substantial post-restructuring.** The sole original indicator was limited to Cross River state at entry and targeted an increase in the number of connections to 50,000. This was exceeded by 50 percent by the closure of the project, thus justifying a High rating against the original PDO 2. At restructuring, the Cross River objective was raised to 75,000 active connections and complemented by three additional indicators, including for Lagos. All four revised indicators were achieved (Table 1), thus resulting in a Substantial rating against the revised PDO 2.

75. **The achievement of the revised PDO 2 indicator target of 75,000 new active connections in Cross River State (Table 1, 2a) was a major success of the final year of the project.** The network densification was financed from the IDA credits in five towns, and from AFD proceeds

in two, though AFD also contributed to repairs, reconnections and registrations across sites in the final year. In mid-2016, an estimated 50,201 active connections were in place.[53] By final project closure 18 months later, the utility had managed to raise this to 75,271 active connections by repairing and constructing connections, reactivating suspended connections and entering existing informal connections into their billing database through a performance improvement program supported by external consultants. Specifically, the increase was driven by the construction of 8,000 new connections in Okpoma and Obubra, as well as the registration of over 2000 informal connections in the other towns. In Calabar, the utility also repaired 3,798 out of 4,747 connections earlier destroyed by roadworks, and re-activated 10,402 suspended connections made under the project by waiving penalty and reconnection fees. [54]

76. **In Lagos, achieving the revised PDO 2 target of 24,000 new active connections (Table 1, 2b) can also be credited to pro-active improvements during the final project phase.** The network rehabilitation and connections were financed directly from IDA in two service areas and AFD credits in two others. This included over 185 kilometers in new pipelines, in addition to the actual house-connections targeted by this indicator. In mid-2016, only 6,544 active connections attributable to the project had been put in place. Since then, LSWC nearly quadrupled the household connections attributable to the project for a total of 26,115. The late surge is explained both by the sequencing of works which started with plant and network expansion before prioritizing connections, as well as a special effort by the Bank and PIU to achieve targets in the final year that included frequent supervision missions, the hiring of external technical assistance and contract amendments to allow the needed additional connections to meet targets. [55]

77. **The third indicator of the revised PDO 2 was the total number of Direct Beneficiaries (Table 1, 2c), with a target of 990,000, which was successfully exceeded.** This figure estimates the number of persons benefiting from the investments made by the project in treatment capacity, water quality and new connections. Using conservative assumptions, the number of beneficiaries was estimated to be at least 1,000,000. [56]

78. **The fourth indicator of the revised PDO 2 (Table 1, 2d) was the number of Female Beneficiaries across project sites, with a target of 50 percent, which was reportedly achieved.** This outcome is a derivative of the third indicator rather than independently measured. [57]

3.2.3 PDO 3 to Improve Commercial Viability of the Urban Water Utilities

Overall PDO 3 Rating: Negligible (pre- and post-restructuring)

79. **The third PDO aimed to "improve the commercial viability of urban water utilities in the Participating States".** All original and revised indicators for this objective were missed and/or dropped, and a pre- and post-restructuring rating of Negligible was thus assigned for PDO 3. As will be outlined below, this was not only due to persistent operational problems, but also political decisions with respect to tariff autonomy and subsidy policies.

80. **The PDO 3 indicator for commercial viability in Cross River State was the percentage of operations and maintenance (O&M) costs recovered from revenue in Calabar (Table 1).** To attempt to achieve this target, the project had financed the construction of tens-of-thousands of household connections to extend the utility's revenue base (Table 1, 2a), and allocated over US$2m in IDA funds for trainings, workshops, study-tours and information technology to improve revenue performance (Sections 1.5 and 1.6). PSP was also meant to improve commercial performance. However, cost recovery from water revenues never rose above 60% during the project. As noted (Sections 2.2 and 5.1), the ambitious indicator target of 100% cost-recovery was

retained at additional financing despite limited progress. In the final project year, the reconciled income and expenditure data shared by the CRSWBL indicates a cost-recovery of 41.4 percent.[58]

81. The Project Appraisal Document specified collections from "revenue" to mean "water sales revenue" (World Bank, 2005, p. 4), thus not counting subsidies in line with the objective of "commercial viability".[59] For consistency, this original definition was retained in evaluating project outcomes. However, it should be noted that the low cost-recovery from water sales revenue is partly due to a decision by the State Government to retain lower tariffs in exchange for regular subsidies to the utility. From this perspective, subsidies may be considered as a de-facto substitute for foregone revenue collection. CRSWBL has indeed received a steady subsidy for staff salaries. If counted towards cost-recovery, this would raise the result from 41.4 percent to 73.8 percent for 2017, though even this remains below target (the remaining gap is due to other direct and indirect subsidies such as for power and chemicals, and debt accumulation).

82. **An identical cost-recovery indicator was added for Lagos at additional financing with an only slightly less ambitious target of 90% by project end.** However, cost recovery never rose above 65 percent in Lagos during the project (Figure 1). Available data indicates O&M cost recovery of 54.4 percent in 2017. In Lagos, the current State Government also committed to "subsidize the various categories of water tariffs" as "part of social responsibilities of the State Government".[60] Including salary subventions would result in 74.3 percent cost recovery and including chemical and energy subsidies would lead to a positive net income for 2017.[61] Subsidies to LSWC are reflected in Lagos state budget allocations for 2016-18, but may change in the future.

83. In both Cross River and Lagos State, political decisions to constrain tariffs in return for subsidies thus contributed to the missed commercial cost-recovery targets. While this exogenous political constraint should be acknowledged, tariff decisions are clearly not the only reason why cost recovery targets were missed. In Cross River, at least one significant tariff increase did occur in 2012-13 and the very low bill collection rate of just 33 percent in 2017 is likely a more important factor. A key reason for the low bill collection at CRSWBL appears to be the disruptive effects of Calabar's change of private operator and subsequent de-privatization in 2015-16 (see Annex 2). The repeated change in management and high staff-turnover compromised an already sub-optimal metering and collection performance. In Lagos, the persistently high NRW is a key reason for the low cost-recovery outcomes (VIPCG, 2016, p. 84). In both states, a performance improvement program initiated in the final project year reversed a previously negative cost-recovery trend (Figures 1 and 2, Section 4), but was insufficient to achieve targets by project closure.

84. **At appraisal, the involvement of the private sector was seen as a core part of the strategy to improve commercial viability in line with government and Bank priorities (see Section 1).** As noted in Section 3.1, the PSP approach did not turn out to be an effective strategy in this project. The PDO 3 indicator for PSP for Lagos State was not achieved by the original deadline and dropped at additional financing. Of the two PSP-related intermediate results indicators, one was dropped at additional financing while the second was retained but missed (Annex 2). The fact that the project failed to implement a successful PSP approach, even though it was originally conceived as central to attaining commercial viability, contributes to the Negligible rating for PDO 3.

3.3 Efficiency

Efficiency Rating: Modest (pre- and post-restructuring)

85. **The overall efficiency rating for the achievement of project development objectives is *Modest***. Costs were higher, financial benefits lower and the implementation period longer than

originally anticipated. The project did undertake serious efforts to achieve an efficient use of resources, but some weaknesses in cost-control occurred. While optimistic efficiency expectations at entry were not met, non-financial economic benefits of the project and longer asset lifetimes than originally assumed should be considered in assessing overall project efficiency.

86. **The economic and financial analyses at entry over-estimated net-present value of the project. Costs turned out to be significantly higher and benefits lower than expected.** The investment case for Lagos, which eventually absorbed more than US$ 165 million of IDA and AFD financing, rested on a positive net-present value (NPV) of only NGN 136 million – barely US$1 million at the time. In fact, the original model for Lagos contained an inaccuracy which, if corrected, would have caused a negative NPV.[62] The NPV for Cross River, which eventually absorbed over US$180 million (of which over US$135 million from IDA), was similarly narrow at NGN 406 million – just above US$3 million at the time (World Bank, 2005). The expected positive financial outcomes were not realized in the expected timeframe of 2005 to 2019.

87. **Achieving the narrowly positive NPV expected at entry would have required a number of strong assumptions about cost and benefits to hold, which did not occur.** For example, the "importance of regular tariff increases" was stressed at appraisal as "very important for the Project's long-run sustainability" along with "the reliability of electricity supplies" (World Bank, 2005, p. 53). The original model for Lagos thus assumed a gradual increase in the tariff from 2011 onwards, but in fact the tariff remained unchanged by the closure of the IDA credits in 2016, though in 2017 higher tariffs for pre-paid meters were introduced. The original model also assumed non-revenue water (NRW) of only 35 percent at outset, declining to 28 percent by 2014, while data from the IBNET database suggests an actual value above 50% at the time. Lower than expected billing collection rates further reduced financial benefits, which was aggravated by higher than anticipated costs. Capital investment costs rose across all project components and on a per-output basis compared to estimates at-entry. Disbursement delays necessitated time extensions and meant that benefit streams from project funded works started later than originally anticipated.[63]

88. **An ex-post re-estimation of the financial model thus results in a negative net-present value (NPV) and Financial Internal Rate of Return (FIRR) at entry, in other words, the project does not appear to have been financially viable within the original timeframe**. The incremental cash-flows from the project were negative for the majority of years in both investment sites and thus investment costs were not recouped within the original target of 15 years as the financial estimation at entry had predicted. Even using permissive assumptions, NPV and FIRR at ICR are negative in both main project sites in the ex-post estimate at ICR (Table 3, Annex 3). [64]

*Table 3: Net-Present Value and FIRR as estimated at entry in 2005 & ICR recalculation **

Site	Lagos	Calabar (Cross River) [65]
NPV at Appraisal (at 10% discount rate)	NGN 136 m	NGN 406m
NPV at ICR (at 10% discount rate)	- NGN 8.5 bn	- NGN 871m
Financial IRR at Appraisal	+ 10 %	+ 13%
Financial IRR at ICR	-12%	-3.5%

89. **While the original model was too optimistic in terms of financial benefits accruing in the original timeframe, it was too pessimistic in ignoring non-financial economic benefits.** At entry, the only expected benefits beyond direct financial revenue of utilities modelled were tax payments made by the project (World Bank, 2005, p. 52). EIRR outcomes at ICR would be negative if this narrow definition of economic benefits was retained. However, this underestimates the full economic benefits of the project by excluding effects such as gains in productive time due

to reduced water fetching distances and lower rates of diarrheal disease, or the value of reduced morbidity. Such benefits are likely to have substantially improved the economic returns to the project given the over 1,000,000 project beneficiaries (WHO, 2012).

90. **An ex-post estimation of EIRR that includes additional economic benefits that were not captured in the model at entry leads to positive EIRRs for the project (Table 4).** As detailed in Annex 3, these ex-post estimates underline the scale of likely economic benefits of the project, but depend on critical assumptions such as the approach to valuing reduced mortality or which economic benefits and beneficiaries are included. For example, the estimate in Table 4 may be higher if benefits accruing to illegally connected customers were also counted or if available data allowed for valuing intangibles such as quality of life improvements. Despite such remaining uncertainties, the ex-post estimation clearly shows that economic benefits of the project are likely significant, especially in Calabar which was allocated more project financing than Lagos and connected more new customers, with associated directly attributable economic benefits.

*Table 4: EIRR as estimated at entry in 2005 & ICR recalculation **

Site	Lagos	Calabar (Cross River)
Economic IRR at Appraisal	+ 13 %	+ 15 %
Economic IRR at ICR [ex-post model including wider range of benefits]	+1%	+21.7 %

* Positive EIRR at Appraisal rested on strong financial benefit streams, which did not materialize as expected (Section 3.2.3); EIRR at ICR presented here takes a wider range of economic benefits into account than at appraisal (see Annex 3 for details)

91. **The original estimation period for NPV and FIRR (2005-19) was also arbitrarily short, which may underestimate financial and economic viability of the project.** A strong argument can be made that a model period longer than at entry (i.e. beyond 2019) should be used to assess financial and economic returns of the project, given the later completion of major works in 2015-17 and assuming a typical useful lifetime of plant and network assets of at least 10-15 years if maintained. In other words, even if financial viability is missed by the original target date, it remains possible given that assets constructed by the project will create benefits beyond 2019.

92. **Sensitivity analysis confirms the importance of tariffs, water losses and energy supply for the project's financial viability, as well as the significant effect of the model period.** In Lagos, a tariff increase to the level of Calabar in 2013 would have led to a positive NPV assuming collection of the additional billings, supply reliability and NRW in line with original assumptions. As detailed in Annex 3, lower than expected NRW and steadier supply would also have had significantly positive effects on financial viability. The significant effect of these variables indicates that exogeneous political constraints on raising tariffs and disruptions in electricity supply, and thus production, due to political violence and a macro-economic crisis (IMF, 2016), worsened financial outcomes significantly and, arguably, beyond what can be reasonably attributed to utility performance alone. In Calabar, the decline in revenue collection accompanying the disruptive changes in management (Annex 2) played a key role in limiting financial benefits, but even with ideal collections performance, the project would have struggled to be financially viable in the original timeframe due to higher than expected investment and production costs.

93. **At entry, no economic and financial analysis was carried out for the secondary systems in Cross River, though NPV and EIRR estimates were provided for some at restructuring.** As detailed in Annex 3, the ex-post analysis at ICR shows that these systems were not consistently operational prior to 2016 and at project closure none of the secondary systems were recovering production costs through collections. A positive NPV and FIRR can thus be ruled out unless a turnaround in financial viability is achieved going forward.

94. **The project did undertake serious efforts to achieve an efficient use of resources, though some weaknesses in cost-control persisted.** Procurement and financial management teams were active in each state and in a supervisory role at federal level, with direct support from the World Bank office in Abuja and regular supervision missions. Supervisory consultancies were hired in line with best practice to ensure infrastructure works were delivered efficiently and on time. Though initial estimates of project costs were too low and necessitated additional financing (Sections 2.1 and 2.2), this was primarily due to lack of detailed pre-feasibility planning, exogenous global price increases and an expansion of project scope, rather than an inefficient use of resources or endogenous cost-escalations.[66] Some weaknesses in cost control must be highlighted, however: An adequate system for monitoring actual versus budgeted expenditures at federal level was still lacking at project end suggesting vulnerabilities in cost-control. In Lagos, internal controls were rated "weak" as late as 2016 (World Bank, 2016, p. 28), with missing internal audits, manual accounting and a lack of a fixed asset register even by IDA closure (see Section 2.4). These weaknesses did not lead to documented wasteful use of resources, though do make it more difficult to fully and confidently evaluate the overall cost-effectiveness of the project.

3.4 Justification of Overall Outcome Rating

95. **The overall outcome rating is Moderately Unsatisfactory due to only modest relevance, and efficiency, though efficacy was substantial.** The rating does recognize the substantial efficacy due to the completion of major infrastructure works that achieved or nearly achieved two out of three PDOs. The resulting significant increase in the quantity and reliability of water supply in the megacity of Lagos as well as in key cities of Cross River state, benefiting over a million Nigerians, is a substantial achievement even if – in retrospect over-ambitious – cost-recovery targets were missed. These achievements, however, are qualified by modest efficiency, given lacking financial viability relative to expectations at entry, as well as modest overall relevance given the weakness of design and implementation in reflecting the project's ambition for sector reform. In brief, the project outcome is Moderately Unsatisfactory, because even though the intervention achieved impressive infrastructure works, it fell short of its larger ambition to reform the urban water sector and put it on a more sustainable basis. Without cost recovery, other project achievements remain vulnerable to political circumstances and exogenous shocks (see Section 4).

Table 5: Overall Outcome Rating and weighted sub-ratings

	Pre-Restructuring	Post-Restructuring	Overall Rating
Relevance of objectives	Substantial	Substantial	
Relevance of design/implementation	Modest	Modest	
Relevance (Overall)	Modest	Modest	
Efficacy	Substantial	Substantial	
Efficiency	Modest	Modest	
Rating	Moderately Unsatisfactory	Moderately Unsatisfactory	
Rating value	3	3	
Weight (% disbursed before and after)	34.96%	65.04%	
Weighted value	1.05	1.95	3
Final rating			Moderately Unsatisfactory

3.5 Overarching Themes, Other Outcomes and Impacts

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

96. Poverty rates are significant in Lagos (40.3 percent) and Cross River State (60.4 percent) (NBS, 2017). [67] Although results of a beneficiary survey suggest a relatively elevated socio-economic profile of direct beneficiaries[68], the successful expansion of access in project sites, including public stand-posts, can be expected to have had a positive impact on poverty in target areas through reduced water costs, time and health savings. A recent study of poverty in Nigeria found that "access to basic infrastructure" such as water was of "crucial importance" for poverty outcomes in Nigeria (World Bank, 2016b). In Calabar, the high rate of access achieved (> 70%) is particularly likely to have had a positive impact that extends to significant sections of the poorer population. The project did not specifically target gender, however, it may be deduced that the female population benefits particularly from an extension of access and more reliable supply, as in Nigeria the responsibility to fetch water falls onto female members in the majority of households in urban areas, and female children more than twice as often than male children.[69]

(b) Institutional Change/Strengthening

97. The project supported a number of longer-term capacity building and institutional strengthening initiatives, including the performance improvement programs of the final project year. At utility level, the project financed a wide array of short-courses both within and outside Nigeria, including on management leadership, procurement, accounting, water quality testing, customer service and work ethics. The project also financed the National Water Resources Capacity Building Network (NWRCBNet), a partnership between the FMWR and six Federal Universities to offer courses in post-graduate water related courses.[70] A further aspect of institutional strengthening was the creation of an incipient "MDG tracking system" (Annex 2).

4. Assessment of Risk to Development Outcome

98. **The risk to the Development Outcome is Substantial.** The capacity of Lagos and Cross River utilities to sustain achievements post-completion remains vulnerable to institutional weaknesses, external shocks and the continued lack of financial autonomy. The failure to achieve cost-recovery targets limits the utilities' scope of action and undermines their ability to guarantee operations and maintenance independently of subsidies. Performance declines such as the one observed as recently as 2015-16 thus remain a substantial risk.

99. **The technology of the rehabilitated plants and network is of standard complexity and does not pose particular risks *per se*, though maintenance is a key vulnerability.** A lack of adequate maintenance and operational standards remain a risk to the technical integrity and long-term sustainability of outcomes. As the 2016 Borrower Completion Report pointed out, "poor maintenance culture was allowed to persist" (VIPCG, 2016). Since then, maintenance risks were mitigated to some extent by the performance improvement programs implemented by both utilities over the final project year. These programs included a variety of aspects likely to improve utility performance such as an assessment of technical and commercial operations, training of utility managers on issues including inventory management, plant maintenance and non-revenue water reduction, as well as a reorganization of business zones and better incentivization of managers (2ML Consulting Ltd, 2018). At project closure it is difficult to distinguish the effect of such capacity building from project financed direct repairs. The long-term impact remains to be seen.

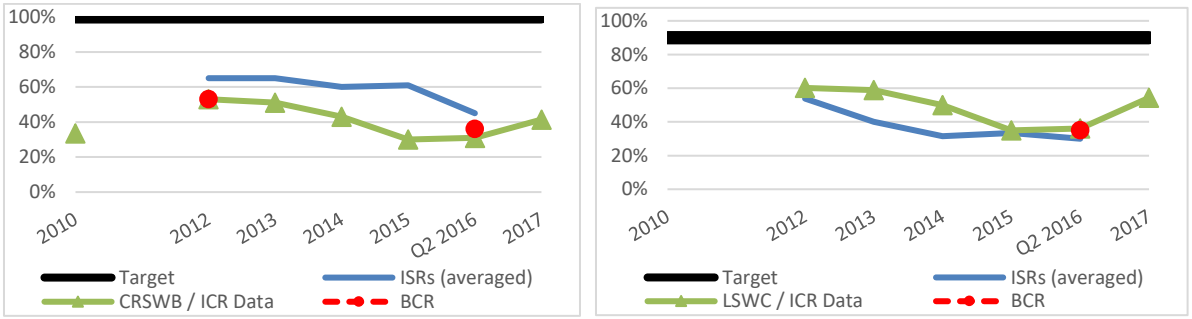
100. **Financial risks to the utilities remain significant as cost recovery was not attained either in Lagos or Cross River State.** The performance improvement programs of the final project year were successful in reversing a multi-year downward trend, but cost recovery remains far below targets. In Cross River state, the most reliable data indicates a peak of cost-recovery at 53 percent

in 2012, followed by a gradual decline to below 40 percent in 2016, with a modest trend reversal at project closure. In Lagos, a reported achievement of 60 percent cost recovery in 2012 was followed by a steady decline below 40 percent by 2016 and a recovery to above 54 percent in 2017 (Figures 1 and 2). The utilities are on the right path, but there is still a considerable way to go.

101. **Until cost-recovery is achieved, recent achievements in supply reliability will remain vulnerable to a repetition of performance declines such as occurred in 2015-16.** After the original rehabilitation of Lagos treatment works by the project, up to 23 hours of supply were reported in 2012-15, as well as a peak realized plant capacity of 77 percent in 2014 (VIPCG, 2016, p. 82). This initial achievement faltered in 2015-16 due to lack of maintenance impacting plant capacity, as well as irregular payments for power and political instability disrupting energy supply (Section 3.2.1). A decline in production capacity due to lack of funding for maintenance was also reported for Calabar prior to project-financed repairs in 2017. The persistent lack of cost-recovery from water sales makes the utilities particularly vulnerable by undermining their capacity to independently maintain infrastructure, hire and retain qualified staff, purchase inputs, pay for grid-electricity and compensate for power outages with generators when necessary. More generally, it makes supply reliability dependent on subsidies and thus changing political circumstances.

102. **Political change and economic shocks have negatively impacted the project, especially towards the end, and remain a substantial risk going forward.** As the utilities remain financially dependent on state subsidies and non-autonomous (e.g. with respect to staffing or tariffs), political change remains a direct risk to their income and management stability. As the BCR noted, there was "a lot of political interference…at the State level" during the project which "resulted in loss of time…knowledge gaps and discontinuity" (VIPCG, 2016, p. 102). Other risks include the impact of political violence on oil and gas supplies and thus energy availability as well as state budgets. Currency risks may also impact reliability of supply and commercial viability as key inputs such as chemicals and spareparts, are imported. The Naira has depreciated significantly over the past decade and utility budgets leave little room for further exchange rate shocks.

Figures 1 and 2: O&M Cost Recovery – Cross-River left, Lagos right (different sources)



5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

Overall Rating: Moderately Unsatisfactory

(a) Bank Performance in Ensuring Quality at Entry

103. **Bank Performance in ensuring quality at entry was moderately unsatisfactory.** While the project was consistent with the strategic goals of the Bank and Nigeria, integrated some lessons

from previous projects, and carried out consultations at federal, state and civil society level, there were nevertheless significant shortcomings in the quality of the project preparation and appraisal.

104. **Shortcomings in preparation and appraisal occurred with respect to three specific aspects:** The delayed completion of detailed baselines and prefeasibility studies led to a suboptimal funds allocation and implementation delays in both sites which the mid-term review explicitly ascribed to a "weak project appraisal" (World Bank, 2010, p. 2). Moreover, while the analysis at entry recognized the importance of institutional and policy reform, this was not translated into a well-defined, realistic reform agenda linked to project development objectives such as commercial viability (e.g. PSP, utility autonomy and tariff reform were seen as critical for commercial viability at entry, but the project's approach proved ineffective). PDO targets on cost-recovery were unrealistically ambitious. Finally, although key risks such as electricity supply and difficulties in realizing a PSP were correctly identified, their severity and required mitigation measures were underrated (see Sections 2.1 and 3.1), which also led to an over-estimation of financial benefits and thus of the project NPV (Section 3.3) leading to only Modest efficiency.

(b) Quality of Supervision

105. **Bank Performance in ensuring quality of supervision was moderately satisfactory. While supervision was weak initially, it improved significantly in the final project phase.** While ISRs, Aide-Memoires and the mid-term review in October 2009 reflect a focus of Bank supervision on development impact and contain at times candid assessments of bottlenecks in project management (World Bank, 2010), monitoring of project indicators suffered from significant quality issues (see Section 2.3.2 and Endnote 71), a concern also raised by the CMU (World Bank, 2013). A better Bank supervision performance would have been more meticulous in verifying project results independently, which could have led to a timelier reaction to shortfalls and better project outcomes. A further shortcoming in supervision was the fact that Bank missions were not always fully documented with no Aide-Memoires filed for four fiscal years. The opportunity of additional financing was also not used to restructure the project with more realistic objectives for PDO 3 on commercial viability even though commercial viability had been highlighted as a concern in a number of ISRs prior to additional financing (World Bank, 2012b).

106. **Bank supervision performance, however, greatly improved in the final two project years.** As noted in Sections 2.2 and 3.2, in 2016-17 frequent supervision missions, the initiation of performance improvement programs and a pro-active role of the Bank team in the amendment of infrastructure contracts were critical for substantially achieving supply reliability and access objectives. Project documentation during these final years was also detailed and complete.

(c) Justification of Rating for Overall Bank Performance

107. **The overall rating for Bank performance is moderately unsatisfactory.** This is an aggregate rating of Bank Performance in Ensuring Quality at Entry (moderately unsatisfactory) and quality of supervision (moderately satisfactory), also noting Outcome (moderately unsatisfactory).

5.2 Borrower Performance

Overall Rating: Moderately Unsatisfactory

(a) Government Performance

108. **Government performance was moderately satisfactory.** Three levels of government are assessed in aggregate – the federal government as well as state level governments in Lagos and

Cross River State. The project enjoyed the support of the federal and state governments and cooperation between the various government institutions – including FMWR, Federal Ministry of Environment, River Basin Development Authority, State Environmental Protection Agencies and the Federal Ministry of Finance – was effective (VIPCG, 2016, p. 99). Some policy achievements of the project testify to the government's willingness to engage with the project agenda, for example the creation of a State Water Regulatory Commission and Office of the Public Private Partnerships (OPPP) in Lagos, or approval of a water resources policy by the Federal Executive Council. The FMWR was reportedly prompt and professional in responding to implementation issues in cooperation with the Bank and SPIUs.

109. **Some moderate shortcomings in government performance must be noted, however:** Firstly, counterpart funds were disbursed only partially and with delay. The initial project design anticipated "counterpart financing of US$10.5 million" to be "shared by the states and the federal government" (World Bank, 2005, p. 32).[72] The borrower did not make these contributions in full and counterpart requirements for the IDA credit were unceremoniously dropped during a reallocation of credit proceeds in 2011 (World Bank, 2011).[73] The additional IDA financing compensated for the loss in government contributions, thus preventing a direct impact on project results. A second problematic aspect was that "interference on project staffing matters resulted in excessive staff turnover, most of the time without consulting the Bank or the FPIU" which created instability and delays in project management (VIPCG, 2016). Finally, changes in government also led to sudden amendments of disbursement rules at state level in 2015, delaying implementation.

110. **Government performance improved in the final phase of the project, contributing to the achievement of supply reliability and access objectives.** There were no more changes in key PIU staffing that occurred, as well as payments of power bills for utilities played a key role in improving supply reliability and disbursement were authorized on time.

(b) Implementing Agency or Agencies Performance

111. **Overall implementing Agency performance was moderately unsatisfactory, though it varied widely between PIUs and improved significantly in the final project phase.** The FPIU and SPIU in Cross River State were comparatively effective. The FPIU implemented its activities smoothly as reflected in World Bank Aide-Memoires. In early 2012 the supervision mission noted that it was "very pleased at the rate at which the Federal component has progressed" and FPIU related tasks such as the dam related activity and capacity building tasks were concluded on time. Shortcomings of the FPIU primarily relate to its monitoring role, in particular the "communication gap" between FPIU and SPIUs which was noted at mid-term (World Bank, 2010) and only partially addressed as shown by the M&E challenges and the belatedly discovered procurement issues.

112. While the SPIU in Cross River State was commended from early on, concerns about the performance of the SPIU in Lagos have persisted from the beginning of the project (World Bank, 2007). An Aide-Memoire noted the limited integration of the SPIU in LSWC in 2009 (World Bank , 2009, p. 8), and at mid-term that "the Lagos PIU should be more proactive in the project implementation to enable the State achieve the project objectives (World Bank, 2010, p. 5). The BCR judged staff turnover to be particularly "excessive" in Lagos with five changes in project coordinators (VIPCG, 2016, p. 103). Serious financial management and procurement challenges occurred in Lagos, including ineligible expenditures and over-commitments (Section 2.4)[38]. The Lagos SPIU thus appears to have under-performed relative to the FPIU and Cross River SPIU.

113. **In line with general project performance, however, implementing agency performance improved significantly in the final phase of the project**. This improvement was instrumental in allowing achievement of infrastructure related supply reliability and access targets as outlined in section 3.2. The implementing agency performance rating should thus be understood as an overall rating since project start, not of performance by PIU staff at closure, which was greatly improved.

(c) Justification of Rating for Overall Borrower Performance

114. **The overall rating of borrower performance is moderately unsatisfactory**. This is the aggregate of Government Performance (moderately satisfactory) and Implementing Agencies' Performance (moderately unsatisfactory), noting the Outcome rating (moderately unsatisfactory).

6. Lessons Learned

115. **A first lesson of NUWSRP2 is that successful sector reform requires a clear agenda and a project design directly addressing political economy constraints and stakeholder incentives.** Reforms are socially, economically and politically interconnected and stakeholders face complex, often contradictory motivations. The NUWSRP2 did not sufficiently recognize and reconcile legitimate stakeholder incentives (e.g. political resistance to tariff increases prior to service improvements) with project goals (e.g. ambitious cost-recovery targets). Future projects with the ambition for "urban water sector reform" must have the clarity of purpose to not only set basic objectives (e.g. cost recovery), but also define a reform agenda with realistic intermediate steps mapped to stakeholders that are incentivized and accountable for achieving them. In NUWSRP2, financing was primarily determined by the progression of infrastructure works, independent of reform progress. This signalled that reform is secondary by focusing financial incentives on disbursements on infrastructure. Tying funding more directly to reform could realign incentives and improve outcomes. New financing mechanisms like the Multiphase Programmatic Approach may offer tools to create clearer incentives. When the primary objective is policy and institutional reform, Development Policy Financing (DPF) should be considered.

116. **A related lesson of the project is the importance of pro-actively managing political support to sustain buy-in and mitigate governance dynamics, including at the local level.** As the project has shown, ensuring political buy-in at entry is necessary, but not sufficient. Changes in key stakeholders can undermine support for key aspects of a project (e.g. PSP), increase risks (e.g. to energy supply if subsidy dependent) or cause disruptions to implementation (e.g. due to PIU turnover, see Section 2.2). To ensure a stable and successful project, political support should be understood as an ongoing concern that must be pro-actively managed. This is particularly so in reform-related projects that require long-term commitment beyond one election cycle to achieve lasting change. Political ownership should also go beyond nominal commitments at national level. Incentives of local stakeholders must be clearly understood, explicitly considered in building coalitions and directly addressed in project design. A continual and pro-active communication strategy targeting stakeholders at local, regional and national level is critical to achieve this.

117. **Thirdly, NUWSRP2 highlighted the centrality of a realistic approach to cost-recovery that allows for long-term operational efficiency gains and service improvements.** As the project experience has shown, overly ambitious commercial cost-recovery targets are at high risk of remaining elusive and may even impair long-term reform. Early pressure to withdraw subsidies and meet demanding commercial cost recovery targets may undermine the ability of reforming utilities to invest in improvements in operational efficiency that lower costs and improve service outcomes in the long-term. If not backed by such operational improvements, short-term revenue

measures such as tariff increases will impose the costs of inefficiency on consumers; this can lead to political deadlock as political representatives resist commercialization while service quality is still lagging. Utilities can then become trapped in a situation of high costs, low revenues and declining performance. A key reason for the performance decline observed in 2015-16 was just such a vicious cycle of low revenue and low performance, aggravated by external shocks (Section 3.2.1). As the performance improvement program in the final project year has shown, a comprehensive approach focused on operational efficiency was needed to reverse such cycles: targeted repairs to restore production capacity; proper incentivization of managers and field staff; introduction of modern metering and billing tools; efforts to instill a culture of payment for water services in clients; and as long as needed, subsidies that are regular and reliable, not arbitrary and unpredictable. PSP may remain part of such reforms under the right circumstances (World Bank, 2017, p. 110), however, this project is a cautionary tale that a more conditional approach to PSP is required – conditional on inclusive local support; on regulation that accounts for equity and quality of supply concerns; and on a legal framework that gives private firms confidence to invest.

118. **Fourthly, if major infrastructure projects proceed to Board without detailed designs, this should be acknowledged at appraisal as a key risk for initially slow disbursements.** In NUWSRP 2, the completion of engineering and baseline studies well after signing of the project agreement caused significant delays versus timelines anticipated at entry, and was the main reason for the major underestimation of costs.[74] While emergency needs or strong credit demand may justify a rapid progression towards approval and effectiveness, the lack of detailed designs is a major risk in terms of duration, cost and scope of infrastructure project that should be highlighted to Bank management and the Board.

119. **A fifth lesson is that World Bank tools to track project commitments and disbursements have considerable room for improvement.** Over-commitments occurred in NUWSRP2 despite similar problems in the predecessor project and explicit warnings by the Country Management Unit prior to closure of the project. This was partly because the World Bank's client connection does not offer useful tools to track *uncommitted* undisbursed funds. Such tracking is only done offline and some PIUs clearly struggle to do so accurately in complex environments with multiple credits, multiple PIUs and shifting exchange rates between SDR, USD and local currency. Bank systems also do not capture and summarize disbursements carried out under co-financing effectively, making it difficult to track overall project allocations by categories.

120. **A sixth lesson from NUWSRP 2 is that M&E in complex projects could be enhanced by independent technical audits.** The ICR observed considerable differences in reported values for key project indicators.[35, 71] As the BCR noted, M&E can be seen as unnecessary or even a threat by implementers, thus disincentivizing accurate results reporting. Independent technical audits at project baseline, mid-term and closure could improve data availability, consistency and accuracy and set clear standards for Bank and PIU monitoring. This would improve the ability of the Bank and client to identify lack of progress and to react appropriately, as well as facilitating the ICR. To ensure neutrality, such technical audits would ideally not be financed from project funds as this can skew incentives of contracted firms in case of controversial or borderline results.

121. **A final lesson is that gender and institutional development objectives should aim for more meaningful, qualitative targets.** The target of "50% female beneficiaries" used in NUWSRP2 is common in Bank projects, but does not measure gender specific impacts in a meaningful manner. The objective was met simply by women making up half of the households in Nigeria. This adds no valuable information to the results framework, nor does it encourage

specific gender sensitive actions. Similarly, the simple binary indicators of NUWSRP2 (i.e. "achieved" or "not achieved") for institutional development objectives such as a "national utility training plan" can be formally met without clarity on the quantity (e.g. persons trained), cost-effectiveness or quality of such activities (Annex 2). This could be mitigated by breaking such objectives down into annual intermediate steps with a clear description of the conditions to be met. Capacity building for staff, in particular, should be part of cohesive programs with qualitative targets that hold "trainees…accountable for using new skills in their day-to-day activities" (World Bank, 2015b). The performance programs of the final project year are examples in this respect.

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

122. Comments on the draft ICR were received from Lagos State Water Corporation (LSWC), the PIU of Cross River State Water Board Limited (CRSWBL), the federal PIU in the Federal Ministry of Water Resources (FMWR) as well as the co-financier, AFD. The comments were addressed and integrated into the present version of the report. Key comments and responses by the ICR team are summarized in Annex 7.

Annex 1: Project Costs and Financing

Original and Actual Allocations by Category (US Dollars)

Categories	PAD Allocation	Additional Financing Allocation	Total Original IDA Allocations **	Actual IDA (Historic Exchange Rates)
Works	$ 128.9m	$ 81.6 m	$ 210.5 m	$ 230.8 m
Goods	$ 4.5 m	$ 6 m	$ 10.5 m	$ 14.9 m
Consultants	$ 36.4 m	$ 19.3 m	$ 55.7 m	$ 39.2 m
Trainings, workshops, and study tours	$ 2 m	$ 2 m	$ 4.0 m	$ 6.1 m
Operating Costs	$ 2.6 m	$ 1.5 m	$ 4.1 m	$ 7.2 m
Critical Treatment Plant Inputs	$ 4.8 m	$ 0 m	$ 4.8 m	$ 8.0 m
Repayment of PPF	$ 2 m	$ 0 m	$ 2 m	$ 0.3 m
Unallocated	$ 18.9 m	$ 9.6 m	$ 28.5 m	
Undisbursed / Cancelled				$ 7.1 m
Total	**$ 200 m**	**$ 120 m**	**$ 320 m**	**$ 313.6 m**
Total disbursed * (excluding undisbursed/cancelled)				**$ 306.5 m**

Categories	Original AFD Allocation	Total Original Allocations (IDA & AFD)**	Final Expected Total (Final IDA and AFD)***
Works	$ 64.6 m	$ 275.1 m	$ 295.4 m
Goods	$ 0.2 m	$ 10.7 m	$ 15.1 m
Consultants	$ 5.5 m	$ 61.2 m	$ 44.7 m
Trainings, workshops, and study tours		$ 4.0 m	$ 6.1 m
Operating Costs		$ 4.1 m	$ 7.2 m
Critical Treatment Plant Inputs		$ 4.8 m	$ 8.0 m
Repayment of PPF		$ 2.0 m	$ 0.3 m
Unallocated	$ 7.4 m	$ 35.9 m	$ 7.4 m
Undisbursed / Cancelled		na	$ 7.1 m
Total	**$ 77.7 m**	**$ 397.7 m**	**$ 391.3 m**
Total Disbursed (excluding undisbursed/cancelled)			**$ 384.2 m**

* The difference between original USD allocations and the final USD Disbursements are the undisbursed/cancelled amount, as well as SDR-USD exchange rate losses on credit 51290 which were only partly compensated by gains on the credit 4086 which commenced earlier

** Original PAD and AF allocations, not taking into account the 2011 re-allocation

*** Information on actual final AFD disbursements per category not available in Bank systems. A full 100% of AFD financing had been disbursed at project closure. At the time of writing of the ICR, the AFD team anticipated that a pending final audit of AFD financing may find additional funds not exceeding $2.214 million ineligible and subject to cancellation and reimbursement.

Annex 2: Outputs by Component

1. This annex describes the achieved outputs by component, following the revised intermediate results indicators (see concise overview in Table 2 of the main text), and including relevant information about contributing outputs. Details about the sources of reported achievements are given in some cases where M&E information was not unambiguous.

2. Component 1: Rehabilitation and Network Expansion

- **Distribution districts of Lagos for which the network is rehabilitated (Table 2, 1a):** The original target of five districts was revised down to 4 at additional financing due to higher than expected costs. Rehabilitation and expansion works of 163.81km were completed with IDA financing in service area 1 (Lagos Island & Ikoyi) and 4 (Ikeja I & II and Oshodi) by May 2016 (World Bank, 2016, p. 4) (LSWC, 2016, p. 5) (VIPCG, 2016, p. 15; p.77; p.109); works on two additional service areas (Victoria Island, Surulere) under AFD funding were substantially completed in November 2017 according to the completion certificates issued by the supervisory consultancies.

- **Percent of Calabar's / other Cross River State towns' population covered by the distribution network (Table 2, 1b):** An independent calculation by the ICR author based on reported connections yields a best estimate of 54 percent and 23 percent of the population covered for Calabar and other Cross River State towns, respectively: The 2014 UN Urbanization Prospects estimated the population of Calabar at 525,000 at the time of project closing. This implies an urban growth rate of approximately 3.5 percent annually from the last census in 2006 which reported 375,196 inhabitants. This is likely a conservative estimate given that the World Bank World Development Indicator database reports an average annual urban population growth of 4.6% in Nigeria during the period. Out of the total of 75,271 active connections reported by CRSWBL, 42,303 were in Calabar and connected sub-stations, alongside up to 356 kiosks. Given an average household size of 4.2 and an estimated average number of 300 persons served per kiosks, this results in 284,472 beneficiaries or 54 percent of the population covered (284,473 /525,000). If it was assumed that each account is, on average, used by two households, this would lead to a coverage of 88%. At IDA closure in 2016, the Beneficiary Impact Assessment Report Survey had found "63% of the beneficiaries' get water supply from the water board" (VIPCG, 2016b, p. 25). Full population data for all smaller cities is not available, but the 2006 census found a combined population of 666,834 in the Local Government Areas of Obubra, Ikom, Ogoja and Obudu. Even assuming no further growth in population since 2006, and given 32,968 individual connections and 58 kiosks, and using the same assumptions on household size and kiosk users, this would yield 155,866 beneficiaries in smaller towns, or 23 percent population coverage (155,866/666,834). Note that LGAs are not necessarily identical with the towns, but have been used as proxies in absence of more specific population data. See Endnote 56 for calculation of Lagos Beneficiaries.

- **New piped household water connections that are resulting from the project intervention (number), (Table 2, 1c):** In Cross River, at least 74,271 new connections are attributable to the project (i.e. 75,271 active connections reported under the PDO 2 indicator minus the baseline of 1,000 connections), and 26,115 in Lagos. This means at least 100,386 new piped household water connections that are resulting from the project

intervention, easily meeting the target of 55,000. [54,55] Note that this component intermediate results indicator was considerably less ambitious than the related PDO indicators (Table 1, 2a and 2b) which have both higher targets and explicitly refer to active rather than total connections.

- **Piped household water connections affected by rehabilitation works undertaken under the project (number), (Table 2, 1d):** The target of 44,000 affected household connections was comfortably met. In Lagos, rehabilitation works included major restorations of Adiyan and Iju treatment works, along with the rehabilitation and construction of a number of smaller water works (VIPCG, 2016, pp. 121-23). This affected at least 35,821 accounts that were active as of December 2017 (2ML Consulting Ltd, 2018). In addition, capital investments also improved supply to at least 75,271 connections in Cross River state (see PDO 2 outcome), for a total of at least 111,092.

- **Number of meters installed (Table 2, 1e):** The target of 55,000 was significantly surpassed. In general, all connections made in Cross River state under the project are metered, as confirmed by utility management during the ICR field mission. This seems backed by the survey carried out as part of the beneficiary impact study which reported that "95 percent of the beneficiaries [in Cross River] have meters that were installed during the course of the project, four percent do not have meters, 1% have meters that were installed pre-project" (VIPCG, 2016b, p. 29). Given a final number of at least 74,271 connections attributable to the project, of which at least 95 percent metered, would yield 70,557 meters installed in Cross River State alone. In Lagos, the beneficiary impact study noted at least 29 percent of "beneficiaries… have meters that were installed in the course of the project" i.e. at least 1,898 out of the 6,544 connections installed at closure of the IDA component (VIPCG, 2016b, p. 29). Supervisory consultancy reports for the 17,811 AFD financed connections made since confirm that these are all metered, and the utility also provided detailed lists with meter numbers and GPS coordinates. Thus, at least over 90,000 meters have been installed, easily surpassing the indicator target.

3. Component 2: Rehabilitation and Network Expansion

- **PS contracts for operation of the treatment works in Lagos (Table 2, 2a):** The PSP component was not achieved in spite of a serious initial effort by LSWC management. In 2009 a multi-day workshop event was held to review possible models, and management resolved on a PSP management model which would contract out both the operation of LSWC Major waterworks (Iju, Adiyan, Akute) as targeted by the project, and in addition the 10 distribution network service areas. However, in spite of a roadmap developed at the time, the PSP contract never came to fruition due to a number of inter-related factors[75]:
    - It proved very difficult to technically delineate the 10 service areas, and thus the idea of contracting out the network services areas under a PSP scheme was eventually abandoned; there was disagreement about the practicality of down- vs. upstream PSP, and ultimately it was felt that without an efficient private operator of downstream activities, not enough revenue would be generated through sales to pay the fees required for the upstream PSP contract(s) either;
    - Lack of a clear legal framework for PSP involvement; the 2004 water law was not updated as the PSP roadmap had required

- Resistance by staff union fearful of job losses;
- Political decision to shift responsibility for PSPs to new Office of Public Private Partnership (OPPP) at state level complicated bureaucratic procedures and authorizations, in particular in the absence of clear political will to proceed with PSP;
- Delay in infrastructure works completion delayed beginning of attempts to find operator ;and
- NGO/Civil society campaign in 2015-16 further heightened pressure against PSP.

- **PSP model piloted for 1 smaller urban town in Cross River – by MTR (Table 2, 2b):** At additional financing stage, the project paper noted that "In the lifespan of the project the physical investment will be feasible, but not the PSP participation which may come at a later stage" (World Bank, 2012)[76]. While the delay in infrastructure investments certainly played an important role in preventing a PSP model for one smaller urban town in Cross River as originally targeted by the project, another factor was the increasingly negative development of the PSP contract in Calabar which had been in place prior to the IDA investments. The Calabar PSP model was effectively given up (deprivatized) in mid-2016, contributing to hesitancy of utility management to retry in a small-town location a model perceived to have failed in Calabar. The original private operator (Ortech) never managed to achieve cost recovery during its period of operation 2005-15 and remained dependent on government subsidies. A decline in these subsidies and change in government led to the hiring of a new operator ("Techvibes") in 2015. The new operators fell short of expectations and the utility effectively took over production in February 2016 followed by commercial operations in April-May 2016, leading to the de-privatization of water supply in Calabar. The utility management has taken a dim view of the contributions of private operators which not only did not achieve cost-recovery, but also failed to maintain infrastructure. While this may be related to sub-optimal contract design (reportedly flat-fees without profit targets and maintenance obligations), the SWA management nevertheless felt hesitant to retry a PSP model and is instead committed to improving performance in a public-sector context. The frequent changes of operators towards the end of the project played a key role in the utility's low operational performance (e.g. with respect to the PDO 3 indicator on cost-recovery).

4. Component 3: Service Sustainability & Project Management

- **Lagos treatment plants capacity attributable to the project (Table 2, 3a):** The target of 120m m3/year in "Lagos treatment plants capacity attributable to the project" (i.e. an increase from a baseline of 60m3/year to 180m3/year) was achieved by the closure of AFD co-financing in December 2017. Following completion of project financed repairs, LSWC reported an available capacity of 118 million gallons per day from the Adiyan, Iju and Isashi plants, equivalent to over 16 million m3 per month, or approximately 200 million m3 per year, assuming the rehabilitated plants can sustain production at this level.

- **Communications and consumer outreach programs operational in Cross River and Lagos (Table 2, 3b):** This target was formally met. In Lagos LSWC conducted a "Citizens Financial Responsiveness Project" implemented by the "Nigeria Network of NGOS (NNNGO) between July-October 2014. This project organized a roadshow in various

locations in Lagos with "a master of ceremony, music, a mascot and a float in tow" (NNNGO, 2016, p. 5) with an MC addressing residents "on issues like the importance of water conservation and prompt payment of bills, the need to report leaking pipes...and of the financial and health disadvantages of providing their own water". Complaints from residents were also taken, and Flyers with contact numbers of local LSWC managers distributed. Some 54 locations within Lagos were reached in a series of one-off events rather than a sustained effort. However, LSWC has also set up 11 customer service helpdesks in its distribution zones. At least two such helpdesks were visited during the ICR mission and unannounced calls to the helpline numbers in January 2017 were answered. It should be noted, however, that the customer care system remains very basic. There is no central help-line but instead various individual mobile numbers of helpline staff, complaints are recorded manually and there is only a very basic capacity to track their resolution even after transferring them into a central database (which is not accessible from the service areas, and does not produce standard reports). In Cross River State, the project financed a "stakeholder's perception study" in 2010 which carried out focus group discussions, interviews and a survey in Calabar to understand attitudes of customers. A "Public Communications Programme Action Plan" was subsequently written, though the extent of its implementation is not clear from project documentation.

5. Component 4: Institutional Development & Policy Reform

- **MDG tracking system for access to potable water & sanitation established and operational in the FMWR (Table 2, 4a):** This target was formally met, though arguably at excessive cost and without a strategy for sustaining it. The original Project Appraisal Document had not defined what was meant by an "MDG Tracking system". National MDG targets were already tracked by the WHO/UNICEF Joint Monitoring Programme, which provides official statistics on JMP targets at the national, urban and rural level based on existing national household survey programmes such as DHS which are available for Nigeria. The NUWSRP2 appears to have interpreted its role relative to JMP as carrying out a more geographically detailed survey of water access across Nigeria, combined with the procurement of dedicated server infrastructure at FMWR to host the resulting data and other relevant sector information, and making it accessible through a custom designed interface. By the end of the project, the survey had been completed, the server infrastructure installed (it was visited by the ICR mission), and templates for continued water data collection had been prepared thus formally meeting the project target.

  While the project target was thus nominally met, a number of weaknesses in the approach should be pointed out. Firstly, physical server infrastructure was procured at the cost of over USD 1million. It is not clear why the proposed database was not hosted by a domestic or international commercial provider instead, which would have cost less than USD 10,000 per year including maintenance and likely be more stable due to its independence of local power supply (additional costs for workstations and software may occur, but still remain far below the costs of a dedicated server-room). Secondly, while templates for future data collection were prepared (e.g. Dams & Reservoirs, Irrigation & Drainage, Water Quality), no clear plan was developed on how the collection of this water related data would be financed and implemented in the longer-term. The assumption appears to be that existing

FMWR staff would collect this data as part of regular work plans, but given the extensiveness of the data collection requirements and additional work and necessary diligence for transferring such data from paper to digital forms, it is not likely this will be feasible without dedicated funding and management at least in the beginning. Thirdly, it is not clear from the available documentation what the database will be used for beyond a general understanding that having detailed water-related data would be useful to various stakeholders. A use-case has never been clearly defined. Finally, the baseline household survey financed by NUSWRP2 was expensive yet used a weak methodological approach that undermined the quality of the resulting data.

The survey involved 13 firms (12 local firms for surveying and one international firm for IT support) and cost approximately USD 4.5m. Selection of households was not randomized or weighted by population, instead a pre-determined number of approx. 22 houses was to be sampled per ward (with slight variations). Households were selected based on the judgement of local surveyors, which may vary greatly across 12 firms and 37 states. While instructions guided firms to aim for representativeness, in one evaluated state enumerators were simply told to "go until you have 22 households". Training of surveyors was carried out by firms with little to no external supervision or quality control. Moreover, even if approximate random selection is assumed, a sample size of just 22 households will likely not suffice to achieve sufficient representativeness at ward level as the initial survey aim had been. The average ward holds as many as 3,800 households, which implies an average margin of error as high as 20% at 95 percent confidence level at ward level. In other words, if the survey result in an average ward showed that safe water access was 50 percent, one could assume the real figure was somewhere between 30 percent and 70 percent, a margin of error too large to be useful for policy decisions. Thus, it is unlikely that this household survey yielded data that truly reflects the situation at ward level, though estimates may be more accurate at LGA level. It should be noted that representative data on water and sanitation access at state level is already available from the DHS2013 survey. It should be noted, however, that it provided useful data at a higher geographical level that was used for the Nigeria WASH Poverty Diagnostic.

- **National utility training plan conceived and implemented (Table 2, 4b):** This target was formally met. According to the Borrower's Completion Report, a National Water Resources Capacity Building Network (NWRCBNet) has been operationalized and been coordinated by the National Institute of Water Resources and six federal universities across the geopolitical zones of Nigeria. These appears to have consistent of agreeing with universities on water-related courses, as well as financing infrastructure for NWRCB offices in the regions.[77] However, the quality, content or number of beneficiaries of these courses is not clear from project documentation. In addition, NUWSRP2 funds were used to finance largely ad-hoc trainings of utility staff in Lagos and Cross River (e.g. courses in "Leadership & Project Team Management" in Montreal, or "High Performance People Skills" at LBS in the UK). The BCR did note that some "officials of the SWAs were of the opinion that the training programs were not properly targeted…not strategic or need-based" (VIPCG, 2016, p. 103)

- **Billing collection rate of LSWC (Table 2, 4c):** This target was missed on an annual basis, though higher values were achieved in the final project months. For 2017, the utility has reported total collections of Naira 1,630,343,778 compared to total billings of Naira

2,356,347,680 i.e. a billing collection rate of 69 percent. Note that this constitutes an improvement relative to the of the figure of 53.52 percent reported for 2015 (VIPCG, 2016, p. 18; 137) (World Bank, 2016), and of only 37 percent reported for the first half of 2016 (LSWC, 2016, p. 14), a decline that was explained as a result of the intermittent production at the time which reduced willingness of consumers to pay for the less reliable services. The improvement since then is due not only to the more regular supply, but also a performance improvement program led by an external consultancy firm financed by the project (2ML Consulting Ltd, 2018). This technical assistance both reduced spurious billings by removing inactive accounts (average monthly billings declined from NGN 252 million in the first half of 2017 to only NGN 140 million in the second half), and increasing collections (average monthly collections increased from NGN 106 million in the first half of 2017 to NGN 165 million in the second half), thus improving the collection efficiency statistic. As these figures indicate, the billing collection rate exceeded 100 percent in the second half of 2017 due to the successful collection of arrears. As the effect of arrears collection is only temporary, and to provide a view of average performance during the year, the annualized figure was used as outcome.

- **Billing collection rate of Cross River State Water Board Limited (Table 2, 4d):** This target was missed. In response to ICR data request, CRSWBL reported a billing collection rate of 33 percent in 2017 with total collections of NGN 272,771,339 compared to billings of NGN 828,305,265. Note that this constitutes an improvement relative to a collection rate of only 21% in the first half of 2016 i.e. by closure of the IDA financing as reported by the utility and similarly in the BCR (VIPCG, 2016, p. 19). The billing collection rate never reached the 95% target, though it briefly came close in 2013, subsequently declining steadily esp. after the disruptions caused by the leaving original private operator, and brief failed take-over of a second private operator in 2015-16. The figure of 60 percent reported in the final ISR (World Bank, 2016) appears to stem from 2014-15 according to figures provided by CRSWBL, but is also below target.

- **Water utilities that the project is supporting, number (Table 2, 4e):** The project only supported two SWAs/utilities, and never intended to support more. It is not clear why this indicator was set to six, but as it is, it was not achieved.

Annex 3: Economic and Financial Analysis

1. The original analytical models for Lagos and Calabar at entry focused nearly exclusively on financial costs of and benefits to the respective utilities and thus the financial net-present value (NPV) and financial internal rate of return (FIRR). The only economic benefits considered in the calculation of the Economic Internal Rate of Return were tax payments made by the project (World Bank, 2005, p. 52). This disregarded the full socio-economic gains of the project as it ignores wider socio-economic benefits such as gains in productive time due to on-premises supply of safe water, reduced incidence of diseases and the value of reduced child mortality rates. Such benefits are likely to have substantially improved the economic returns to the project given the over 1,000,000 project beneficiaries. At entry, no financial or economic analysis was undertaken for the secondary towns of Obudu, Ogoja and Ikom "as there was insufficient information to model the three smaller cities." (World Bank, 2005, p. 52).

2. At additional financing, the analyses for Lagos and Calabar were not explicitly revised. Economic analyses for some secondary towns were undertaken, but not for Obudu (World Bank, 2012, pp. 15-16). Except for the overall results captured in the project paper, none of the model calculations or detailed assumptions have been archived and were also not available from the World Bank task leader managing the project at the time upon request by the ICR team.

3. The ex-post financial and economic analysis undertaken for this Implementation Completion Report has thus involved the following key tasks:

- Financial Analysis for Lagos and Calabar in line with the framework of the original model at appraisal. This allows conclusive judgement of financial viability of the project at closure in relation to expectations at entry;
- Economic Analysis for Lagos and Calabar, including an estimation of socio-economic benefits disregarded at appraisal.
- Summary analysis of economic and financial impact in the secondary towns. Given the original models were not archived, a comparison within the original model framework was not possible. Nevertheless, this ICR has carried out a summary analysis to put likely financial and economic performance of the secondary sites into context.

Financial Analysis for Lagos and Calabar

4. Lagos: The original financial model was re-estimated using actual disbursements on investments, incremental water production and sales. Model input data was provided directly by the utility LSWC as well as taken from project documentation (Aide Memoires, Implementation Status Reports, Completion Certificates, Client Connection for investment costs). In particular:

- Modelled costs include the total investment costs as captured by disbursements for Lagos in World Bank Client Connection supplemented by allocations of AFD co-financing (see table A3.1). Moreover, costs also include incremental costs of production estimated as incremental water production times cubic meter costs for Energy, Chemicals and Maintenance. These were N23.4/m^3 as per the original model, and from 2017 slightly higher at N27.8/m3 as per the data provided by the 2ML consultancy report (2ML Consulting Ltd, 2018).
- Benefit streams are based on estimated incremental water sales, that is, water sales attributable to the project, based on known incremental production and tariffs;

5. The Net Present Value (NPV) and Financial Internal Rate of Return (IRR) results cited in Section 3.3 are the output of the model reproduced in shortened form in Table A3.1 below and compared to original model outcomes in Table A3.2. The primary reason for the negative NPV and Internal Rate of Return are incremental revenues that were lower than anticipated, combined with higher than anticipated investment costs (see Sections 1.6 and 2.2). When multiple data sources were available, or assumptions had to be made to substitute for data gaps, an optimistic scenario was chosen. The overall negative financial outcomes are thus relatively robust, as further confirmed in the sensitivity analysis. In particular:

- The lowest cited pre-rehabilitation capacity (60 m m3/year as per the PAD) was used as base, resulting in relatively higher incremental water production and revenues than if a higher base was used e.g. 84m m^3/year documented in a 2009 Aide-Memoire (World Bank, 2009).
- Production for 2018-2019 assumes the peak production achieved in December 2017 can be sustained at this level going forward, and no further declines as in 2015-16 occur;
- In the absence of reliable non-revenue water (NRW) data, the NRW assumption was set low (30%) in all years except for when an actual value is documented in IBNET;
- Billing collection rates were assumed in line with the original model;
- Every additional cubic meter of water produced was counted as project related revenue, rather than only those sold in the districts that were targeted by the intervention; this is justifiable as treatment plant improvements generally served to improve supply across the entire network;
- The production costs of the original model were retained for the period 2005-16 rather than using production costs per cubic meter from the IBNET database which are higher; for 2017 and onward, actual production costs documented by the utility were used;
- Average realized tariffs per m^3 was assumed to increase in 2018-19 (too NGN100/m^3 and NGN150/m^3 respectively) driven by an assumed continued and successful adoption of higher tariffs for pre-paid connections;

Table A3.1: Summary of Re-estimated Model for Lagos

NPV	(NGN 8,482,214,485)
Discount Rate	10%
IRR	-12%

ACTUAL	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013-19***
Incremental Water Production (m3/y	0	0	0	0	65,000,000	65,000,000	65,000,000	102,500,000	652,982,493
NRW Assumption (%)	0.3	0.3	0.3	0.3	0.3	0.3	0.4734	0.4452	0.384871429
Incremental Water for Sale	0	0	0	0	45,500,000	45,500,000	34,229,000	56,867,000	376,207,179
Tariff (NGN)	50	50	50	50	50	50	50	50	71.42857143
Incremental Revenue	0	0	0	0	2,275,000,000	2,275,000,000	1,711,450,000	2,843,350,000	29,681,694,366
Incremental Expenses	0	0	0	0	1,521,000,000	1,521,000,000	1,521,000,000	2,398,500,000	16,266,183,657
IDA Investments in Lagos (NGN)	0	20,690,801	345,964,896	1,301,138,285	3,147,592,954	3,623,407,746	2,795,733,546	3,530,720,198	6,117,257,274
AFD Investments in Lagos (NGN)	0	0	0	0	0	0	0	0	7,359,522,526
Total Investments in Lagos (NGN)	0	20,690,801	345,964,896	1,301,138,285	3,147,592,954	3,623,407,746	2,795,733,546	3,530,720,198	13,476,779,800
Net incremental flows from Project	0	-20,690,801	-345,964,896	-1,301,138,285	-2,393,592,954	-2,869,407,746	-2,605,283,546	-3,085,870,198	-61,269,091

* Column for 2013-19 provides sums (averages for tariff and NRW assumption). Note that non-linear tariff increase assumed for 2017-19

Table A3.2: Results of Ex-Ante and Ex-Post Financial Cost-Benefit Model

	Lagos
NPV at Appraisal (at 10% discount rate)	NGN 136 m
NPV at ICR (at 10% discount rate)	- NGN 8.5 bn
Financial IRR at Appraisal	+ 10 %
Financial IRR at ICR	-12%

6. Calabar: The original model was re-estimated for Calabar with actual investment costs and the best available information on incremental revenues and costs over the period provided by the utility and project documents (Tables A3.3 and A3.4).

7. At appraisal the Cross River model was limited to Calabar.[66] Note that the re-estimated model is based on directly reported (incremental) production and revenues and exchange-rate adjusted Client Connection data on investment costs, rather than an estimate of sales based on active connections and tariffs (though these are listed below for information purposes), because data on the latter is incomplete and would likely lead to less precise estimates of actually realized incremental benefits and costs than the data captured in financial M&E statements.

8. As in the case of Lagos, this model made relatively permissive assumptions. In particular, following the example of the original model, billed revenues were used for the benefit stream, rather than actual collections, which were significantly lower and would lead to reduced NPV and IRR values.

Table A3.3: Re-estimated model for Calabar

NPV	(NGN 871,035,151)
Discount Rate	10%
IRR	-3.5%

ACTUAL	2005	2006	2007	2008	2009	2010	2011	2012	2013-19*
Incremental Water Production (m3/yr)	0	0	0	0	0	3,520,000	3,095,000	6,478,000	42,607,272
Incremental Private Connections (Calabar incl. sub-systems)	0	0	0	8,250	17,500	21,500	19,584	22,244	Up to 42,300
NRW									
Incremental Water for Sale									
Tariff (NGN) - Private		100	100	100	100	100	100	100	150
Connection fee (NGN)		2000	2000	2000	2000	2000	2000	2000	2000
Tariff (NGN) - Commercial		125	125	125	125	125	125	125	200
Tariff (NGN) - Kiosks		55	55	55	55	55	55	55	120
Incremental Revenue (Billings)	0	0	0	135,051,163	270,102,326	331,840,000	236,000,000	433,770,000	4,372,071,298
Incremental Expenses (Actual)						373,500,000	268,500,000	192,700,000	1,209,496,903
IDA 4086 in CR (NGN) - Primarily Targeting Calabar	0	188,402,478	408,499,232	1,221,710,417	969,815,045	957,732,698	573,818,457	612,958,890	3,660,421,858
IDA 5129 in CR (NGN) - Primarily targeting Ogoja and Ikom	0	0	0	0	0	0	0	0	18,126,581,207
AFD Investments in CR -Obubra & Okpoma (NGN)	0	0	0	0	0	0	0	0	9,486,522,452
Total Investments in CALABAR (NGN)	0	94,201,239	204,249,616	610,855,209	484,907,523	478,866,349	286,909,229	306,479,445	1,830,210,929
Net incremental flows from the Project	0	-94,201,239	-204,249,616	-475,804,046	-214,805,197	-520,526,349	-319,409,229	-65,409,445	1,332,363,465

* Column for 2013-19 provides sums (average for tariff); Note that this is for Calabar connections only, excluding secondary towns

Table A3.4: Results of Ex-Ante and Ex-Post Financial Cost-Benefit Model

	Calabar (Cross River)
NPV at Appraisal (at 10% discount rate)	NGN 406m
NPV at ICR (at 10% discount rate)	- NGN 871m
Financial IRR at Appraisal	+ 13%
Financial IRR at ICR	-3.5%

9. **Sensitivity analysis:** Sensitivity Analysis confirms the importance of tariffs, water losses and electricity supply for the financial viability of the project, as well as the key role of the assumed asset lifetime (i.e. the model timeframe for estimated net benefit streams).

10. In Lagos, a tariff increase to the level of Calabar in 2013 (NGN 150 per m^3) would have led to a positive NPV assuming collection of the additional billings, supply reliability and NRW in line with original assumptions (Scenario A, Table A3.5). This indicates that exogeneous political constraints on raising tariffs worsened financial outcomes significantly.

11. Financial outcomes would also have been significantly better with lower than expected non-revenue water and without the 2015-16 supply disruptions (Scenario B, Table A3.5), illustrating the negative effect of energy and thus production shortfalls during that period. Finally, the positive effect of allowing for longer asset lifetimes by extending the model period by ten years is shown in Scenario C. An analogous effect is illustrated for Calabar (Scenario D).

Table A3.5: Results of Ex-Ante and Ex-Post Financial Cost-Benefit Model

Site	**Lagos***
NPV at Appraisal	NGN 136 m
NPV at ICR – Base Scenario	- NGN 8.5 bn
Scenario A: NPV with Tariff Adjusted to NGN 150/m3 in 2013, *ceteris paribus*	+NGN 1.06 bn
Scenario B: NPV with NRW at 50% of base scenario and peak 2014 production sustained without interruption	- NGN 992 m
Scenario C: NPV with model timeframe expanded from 2019 to 2029, *ceteris paribus*	+NGN 3.27 bn[78]
Site	**Calabar (Cross River) ***
NPV at Appraisal	NGN 406m
NPV at ICR	- NGN 871m
Scenario D: NPV with model timeframe expanded from 2019 to 2031, *ceteris paribus*	+ NGN 19 m
Scenario E: NPV with Discount Rate at 5%, *ceteris paribus*	- NGN 846 m

* Scenarios retain other baseline assumptions to illustrate the sensitivity of financial returns to variation in key variables

Economic Analysis for Lagos and Calabar

12. The ex-post model of economic costs and benefits builds on the financial model outlined above.

13. **Economic costs:** Economic costs are taken to be the cost of water investments and the incremental operation and maintenance (O&M) costs associated with the increased access and water consumption.

14. **Economic benefits:** At entry, modelled economic benefits beyond financial utility revenue were limited to tax payments made by the project. A re-estimation of EIRR in which economic benefits are similarly limited to tax payments by the project results in negative or near-negative values. However, this would be too narrow and pessimistic a view of project outcomes as it excludes other positive economic benefits likely to have accrued to the over 1,000,000 project beneficiaries. A wide range of economic benefits can result from improved water access as outlined in Table A3.6 below.

Table A3.6: Range of Benefits of improved drinking water supply (WHO, 2012, p. 26)

Benefit Category	**Description**
Health (direct)	- Averted cases of diarrheal disease - Averted malnutrition-related diseases - Averted health related quality of life impacts
Health (indirect)	- Averted costs related to diseases such as health care, productivity, mortality
Time value	- Travel and waiting time averted for collecting water

Education	- Improved educational levels due to higher school enrolment and attendance rates - Impact of childhood malnutrition on education
Leisure and quality of life / intangibles	- Leisure and non-use values of water resources and reduced effort of averted water hauling and gender impacts
Property	- Rise in value of property
Income	- Increased incomes due to more business opportunities / productive uses of clean water

15. The ex-post economic analysis undertaken at ICR stage has thus modelled core benefits resulting from the project to better reflect its actual economic impacts and thus project efficiency. Estimating these benefits with precision is challenging in the absence of representative surveys of the cities and beneficiary populations targeted by the project to obtain accurate estimations of data such as willingness to pay, pre- and post-intervention water quality and disease incidence, cost of care, and so on. The ex-post model has used the following data sources and assumptions for modelling core economic benefits:

- *Utility revenues:* These were part of the original model and are identical to the values in the financial analysis (see Tables A3.1 and A3.3). Revenues reflect the producer surplus (after operational costs), as well as part of the economic value of potable water consumption accruing to consumers.
- *Value of productive time saved fetching water:* Using data from the Nigeria Demographic and Health Survey 2013 (NPC and ICF International, 2014), the model estimates savings in water fetching time as the difference between fetch-time for households without and with on-premises water supply in urban areas of the project region. For households that switched from the former to the latter due to the project, time savings are valued at 30 percent of the Gross Domestic Product per capita for adults, 15 percent for children over 5 years of age, in line with similar calculations by WHO (WHO, 2012, p. 30). GDP per capita values were based on World Bank World Development Indicator dataset (Series NY.GDP.PCAP.CN), and adjusted for the urban economies of Lagos and Calabar, respectively, using city specific GDP estimates (Canback, 2018).
- *Value of productive time saved due to lower diarrheal disease incidence:* This benefit was calculated as the value of the reduced time caregivers have to spend with children sick with diarrhea due to contaminated water. The number of affected children was derived based on project beneficiaries (see Table 1 and associated footnote) and data from the DHS 2013 survey. Only the percentage of children beneficiaries likely to have switched from unimproved sources were used for the estimate (i.e. not those who had improved, non-piped sources such as covered wells prior to obtaining piped connection under the project). Background diarrhea incidence was calculated taking into account data on average episodes per year (Walker & Perin, 2012) and average duration per episode for children under and above five years of age (Lamberti, Walker, & Black, 2012). Expected reduction in diarrhea due to connection to improved piped water was then estimated based on data from a recent randomized controlled trial in neighboring Ghana (Cha, et al., The Effect of Improved Water Supply on Diarrhea Prevalence of Children under Five in the Volta Region of Ghana, 2015). Following earlier work by the World Bank Water and Sanitation program, it was assumed

that child sickness leads to diversion of carers from other activities at a rate of two hours per work day (WSP, 2012). The time value was then assigned at 30 percent of equivalent, regionally adjusted GDP per capita as above.

- *Value of Reduced Child Mortality:* This estimate uses as Value-of-Statistical life approach, previously used by the WHO in the context of WASH benefits estimation (WHO, 2012, p. 30) to model the value of reduced child mortality. Using WHO data on deaths of children under five due to diarrhea in Nigeria (WHO and Maternal and Child Epidemiology Estimation Group - MCEE, 2015), the implied number of child deaths among the beneficiary population was derived. Mortality was then assumed to decline proportionally to the reduction in diarrhea incidence. The child deaths prevented were then valued using a Nigeria specific "Value of Statistical Life" estimation for 2012 (Yaduma, Kortelainen, & Wossink, 2013) that was adjusted by a GDP deflator for other years, as well as for regional GDP differences drawing on Lagos and Cross River specific GDP estimates (Canback, 2018).

16. These benefits were estimated for all households benefiting from new connections financed directly by the project. Aggregating these costs and benefits and using the original discount rate of 10 percent yields, the following Economic Internal Rates of Return for Lagos and Calabar, respectively:

Table A3.7: Results of Ex-Ante and Ex-Post Economic Cost-Benefit Model

Site	Lagos	Calabar (Cross River)
Economic IRR at Appraisal	+ 13 %	+ 15 %
Economic IRR at ICR [ex-post model including wider range of benefits]	+1%	+21.7 %

17. Results are more positive for Calabar, which received more project funding than Lagos, in the ex-post model due to benefit estimates deriving from the number of connections directly attributable to the project, which were significantly higher in Calabar than Lagos (though the latter system has more customers over all).

18. It is important to recognize that these estimates provide a sense of the dimension of likely economic benefits, however, are subject to wide estimation intervals in line with the underlying assumptions and quality of available data. For example, economic benefits may be significantly higher if one would account for illegal connections (i.e. beneficiaries who are de-facto deriving benefits from the improved safe water supply, but not paying regular tariff and not officially captured in utility databases), if one assumed more than one household benefiting per connection, as is often the case in sub-Saharan Africa, or if the available data allowed capturing other economic benefits outlined in Table A3.6. On the other hand, for example, different methods of valuing mortality reduction (e.g. a human capital instead of a value-of-statistical life approach) may lead to lower economic benefit estimates. Despite these possible variations in estimates of economic benefits, it is clear that economic benefits of the project accruing to the project beneficiaries are likely to be significant. This justifies a Modest rating for Efficiency, even if financial returns, and the narrowly defined economic returns of the original model, were significantly less than anticipated at entry.

Summary Analysis - Cross River Secondary Towns (Ikom, Ogoja, Itigidi, Obubra, Okpoma)

19. While it was possible to carry out an ex-post analysis comparable to the model at entry in the case of Lagos and Calabar, this is not feasible for the secondary cities in Cross River state. Neither at restructuring nor at entry were Financial IRRs calculated. NPV and EIRR estimates were given in the project paper at restructuring (Table A3.8), however, the model containing the underlying calculations and detailed assumptions was not archived.

Table A3.8: Results of Economic Analysis as presented at Restructuring (World Bank, 2012)

Cross River Secondary Cities	NPV ($m)	EIRR (%)
Ikom	3.2	12.1
Ogoja	16.1	18.8
Itigidi	-4.9	6.2
Obubra	1.3	11.2
Okpoma	11.5	19.1
Obudu	-	-

20. Moreover, project monitoring did not provide routine detailed and consistent data disaggregated by secondary towns, as these were treated as an aggregate in the results framework. It is thus not feasible to re-run a comparable analysis at ICR. However, the key facts can be surmised:

21. Production only (re)started in the secondary towns in 2016. By the end of 2017, water production volume and billings across all secondary cities amounted to 16 percent and 15 percent of the capital Calabar, respectively (see Table A3.9). In terms of revenue, the secondary cities generated billings amounting to 68% of estimated production costs, but actual collections were only 15 percent of costs on average, that is, even lower than in Calabar. In other words, none of the small systems generated sufficient collections to pay for production in 2017 with an average cost recovery gap of 85 percent.

Table A3.9: Results of Economic Analysis as presented at Restructuring (World Bank, 2012)

Cross River Secondary Cities	Accounts	Production (2017, m3)[79]	Production Cost (2017, NGN) (2ML Consulting Ltd, 2017)	Billings (2017, NGN)	Collections (2017, NGN)	Billings-Costs Ratio	Cost-Recovery (Collections)
Itigidi	5,294	92,705	17,171,184	13,363,304	4,928,482	78%	29%
Obubra	5,000	191,125	13,617,144	13,722,846	1,486,250	101%	11%
Ikom	10,520	205,309	29,267,760	21,542,902	4,011,176	74%	14%
Ogoja	4,122	354,158	51,177,864	26,442,397	5,193,020	52%	10%
Okpoma	3,000	77,191	13,758,480	8,234,076	5,033,188	60%	37%
Obudu	5,032	169,698	27,115,620	20,139,308	2,840,955	74%	10%
TOTAL	**32,968**	**1,090,186**	**152,108,052**	**103,444,833**	**23,493,071**	**68%**	**15%**

22. It is clear from this data that continued operation at loss of these systems will *not attain a positive net present value or FIRR* in light of capital investment allocations of nearly US$140 million to these small towns (World Bank, 2012). Net benefit streams cannot be positive as required for financial viability unless there is a major improvement in billing and collection efficiency in the future. There is a high risk that the utility will struggle to do so in light of its past performance on cost recovery even in its main site in Calabar.

Annex 4: Bank Lending and Implementation Support Processes

(a) Task Team members

LENDING (to FY2006)		
Names	**Title**	**Unit**
Alexander McPhail	Lead Water Supply and Sanitation Specialist (TTL until 2007)	AFTU2
Hassan Kida	Sr Water and Sanitation Specialist (TTL 2011-2016)	AFTU2
Lars Rasmusson	Engineer	AFTU2
Arthur Swatson	Engineer	AFTU2
Karen Hudes	Country Lawyer	LEGAF
Jan Franck	Financial Advisor	AFTU2
Wole Afolabi	Financial Advisor	AFTU2
John Boyle	Environmental Specialist	AFTS 1
Tony Chen	Disbursements Officer	LOAG2
Nike Mustafa	Financial Management Specialist	AFTFM
Edward Olowo-Okere	Financial Management Specialist	AFTFM
Bayo Awosemusi	Procurement Specialist	AFTPC
Jan Janssens	Program Manager	EWDWS
Daniele Calabrese	Communications Officer	EXTCD
Massimiliano Giamprini	Communications Officer	EXTCD
Esther Monier-Illouz	Stakeholder Specialist	AFTU2
Comfort Onyej e Olantunj i	Project Support	AFTU2
Maya El-Azzazi	Project Support	AFTU2
Modupe Day0 Olorunfemi	Project Support	AFTU2
SUPERVISION / ICR (FH2006-FY2018		
Names	**Title**	**Unit**
Camilo Lombana Cordoba	Sr Water and Sanitation Specialist (TTL since 2016)	GWA8
Hassan Madu Kida	Sr Water and Sanitation Specialist (TTL 2011-2016)	GWA07
Adebayo Adeniyi	Procurement Specialist	GGO01
Bayo Awosemusi	Procurement Specialist	GGODR
Akinrinmola Oyenuga Akinyele	Financial Management Specialist	GGO25
Joseph Ese Akpokodje	Environmental Specialist	GEN07
Amos Abu	Senior Environmental Specialist	AFTN1
Michael Gboyega Ilesanmi	Safeguards Specialist	GSU01
Ruth Adetola Adeleru	Team Member	AFCW2
Caroline Mary Sage	Senior Social Development Specialist	EASID
Chukwudi H. Okafor	Senior Social Development Specialist	ECSS4
Belinda Lorraine Asaam	Program Assistant	AFTU1
Andrew Makokha	Sr Water and Sanitation Specialist (TTL 2009-11)	AFTUW
Thomas Kwasi Siaw Anang	Senior Procurement Specialist	AFTPC
Armele Vilceus	Senior Program Assistant	LCC3C

Sunday Achile Acheneje	Procurement Specialist	GGO01
Joyce Chukwuma-Nwachukwu	Procurement Assistant	AFCW2
Mary Asanato-Adiwu	Senior Procurement Specialist	GGOGI
Oluwole Temiloluwa Afolabi	Local Consultant ST	GWA07
Mary Oluseyi Zackius-Shittu	HR Business Partner	HRDPR
Joseph A. Gadek	Consultant (TTL 2007-2009)	GSU13
Jan Franck	Consultant	MNSSD
Africa Eshogba Olojoba	Lead Environmental Specialist	GEN05
John A. Boyle	Senior Environmental Specialist	AFTS 1
Alexander A. McPhail	Lead Water Supply and Sanitation Specialist (TTL until 2007)	-
Lars A. V. Rasmusson	Consultant	AFTU2
Maya El-Azzazi	Operations Analyst	GSP05
Arthur Majoribanks Swatson	Water & Sanitation Specialist	-
Adenike Sherifat Oyeyiola	Practice Manager	-
Maximilian Hirn	Economist / ICR Author	GWA08
Elisha John Soni	Consultant	GWA08

(b) Staff Time and Cost

	Number of Staff Weeks					Costs including travel and consultants (USD)				
	LEN	SPN	SPNE	SPNS	Total	LEN	SPN	SPNE	SPNS	Total
FY01	11.23				11.23	117,082.5				117,082.5
FY02	10.10				10.10	154,066.3				154,066.3
FY03	8.67				8.67	22,979.9				22,979.9
FY04	15.85				15.85	81,190.5				81,190.5
FY05	42.65				42.65	312,898.1				312,898.1
FY06	16.53	29.07			45.60	62,144.1	174,602.9			236,747.0
Subtotal LEN	105.03				134.10	750,361.26				750,361.3
FY07		35.00			35.00		179,586.7			179,586.7
FY08		39.38			39.38		154,803.0			154,803.0
FY09		30.41			30.41		141,924.2			141,924.2
FY10		20.47			20.47		115,187.4			115,187.4
FY11		21.80			21.80		127,417.2			127,417.2
FY12		38.00			38.00		196,724.3			196,724.3
FY13		20.91			20.91		103,914.6			103,914.6
FY14		19.39			19.39		121,547.7			121,547.7
FY15		28.73			28.73		211,934.5			211,934.5
FY16		20.26	0.50	1.40	22.16		145,206.3	1278.4	10709.19	157,193.9
FY17		44.08	0.38	0.25	44.71		299,173.3	958.8	9807.48	309,939.6
FY18		10.12			10.12		116,570.2			116,570.2
Subtotal SPN		357.62	0.88	1.65	360.15		2,088,592.23	2,237.20	20,516.67	2,111,346.10
Totals	**105.03**	**357.62**	**0.88**	**1.65**	**465.18**	**750,361.26**	**2,088,592.23**	**2,237.20**	**20,516.67**	**2,861,707.36**

Annex 5: Beneficiary Survey Results

1. The Borrower submitted a Beneficiary Impact Study Report summarizing the results of a Beneficiary Survey in July 2016 after the closure of the IDA credits IDA-40860 and IDA-51290.

2. The primary purpose of the Beneficiary Impact Study was to evaluate the level of impact the project achieved for the beneficiaries in line with the agreed PDOs and the Performance Indicators. The study report described its methodology as follows: "The methodology employed included one-on-one interview of water utility officials, observation of facilities and locations, and administration of survey questionnaire to businesses, institutions, and residents of the various locations. A survey questionnaire was developed and presented to the National Project Office for review, input and approval. Thereafter visits were scheduled to the various Water Boards/Corporations in the two States.

3. Surveyors visited every location in each State, interviewed, and administered the questionnaires to as many as 250 people per location. The Surveys were administered by a minimum of four surveyors per location. Forty-four (44) surveyors conducted the surveys over a period of 5 – 7 working days." (VIPCG, 2016b, p. 3)

4. The report summarized the findings of the survey as follows: "Our findings indicate that the impact of the project is yet to be fully felt in both States. The achievement of the project was highest in the middle of the project period, but began to regress towards the end. The achievement and the impact in Cross River State though not outstanding, out paces Lagos State. Though much work was done to improve the infrastructure, unavailability of power to run the equipment is a major hindrance to improved performance. On inspection, it was noticed that in Lagos State some plants were idle not just because of inadequate power supply, but because of frequent break-down and lack of regularly scheduled maintenance.

5. The beneficiaries attested to the fact that the service received has improved in terms of quality, quantity, regularity and pressure. In Lagos, there was a significant regression in the improvement, such that the level of service is practically at pre-project levels. In Cross River State where there was significant improvement, in the last year of the project, there is clear evidence of regression that could erode the gains of the project if not checked.

6. Service quality is highly dependent on rate of O&M recovery. Change in government as well as change in government financial policy regarding revenue has impacted operational performance and by extension O&M recovery. Furthermore, in Cross River, the PPP arrangement which is in danger of been abandoned, is a major threat to the result achieved by the project." (VIPCG, 2016b, p. 11).

7. It should be noted that the Beneficiary Surveys were carried out at the conclusion of the IDA credits in 2016 and therefore do not fully reflect the significant achievements of the final years of AFD co-financing in 2016 and 2017.

Annex 6: Summary of Borrower's ICR and Comments on Draft ICR

1. The Borrower submitted a Borrower Implementation Completion Report (BCR) for the credits IDA-40860 and IDA-51290 in the amount of XDR 210.2 million in July 2016 after the closure of the IDA credits. The report was compiled by a local consultancy firm (VIPCG) on behalf of the Federal Ministry of Water Resources. The BCR returned an overall outcome rating of *Moderately satisfactory*, with the following key performance ratings:

Performance Rating by Borrower	
Outcomes:	Moderately Satisfactory (VIPCG, 2016, p. 84)
Risk to Development Outcome:	Moderate (VIPCG, 2016, p. 93)
Bank Performance:	Satisfactory (VIPCG, 2016, p. 97)
Borrower Performance:	Satisfactory (VIPCG, 2016, p. 100)

Detailed Ratings of Bank and Borrower Performance by Borrower	
Bank Performance	
Bank Performance in Ensuring Quality at Entry	Satisfactory (VIPCG, 2016, p. 98)
Quality of Supervision	Moderately Satisfactory (VIPCG, 2016, p. 98)
Borrower Performance	
Government Performance:	Satisfactory (VIPCG, 2016, p. 100)
Implementing Agency or Agencies Performance:	Moderately Satisfactory (VIPCG, 2016, p. 99)

2. The overall *Moderately Satisfactory* outcome rating was justified as follows in the BCR: "Overall Outcome rating of "Moderately Satisfactory" is reasonable for the following reasons:

i. Based on available data, some of the PDOs were achieved, while others were achieved half way;
ii. The project was close to achieving some of the KPIs (see Annex 2);
iii. Project direction meetings and supervision missions led to timely resolution of some implementation issues which could have delayed the project;
iv. Technical assistance and active participation of the FPIU in the resolution of implementation issues;
v. PIUs adherence to implementation arrangement;
vi. PIUs adherence to the Bank's Policies and Procedures;
vii. 100-day Performance Improvement Program (PIP) in Cross River State;
viii. High levels of innovation and creativity on the part of the FPIU, the SWAs and SPIUs especially the development of financial modelling as a management tool for SWAs and PIUs for tracking achievement of project target;
ix. High potential for financial sustainability and quality service delivery, once issues of availability of power is resolved;
x. Post implementation sustainability plans to sustain the gains of the project" (VIPCG, 2016, p. 85)

Annex 7: Comments of Borrower, Co-financier and Other Partners

Comments from the Borrower/ Implementing Agency

Comments by Federal PIU / Federal Ministry of Water Resources (received 7th May 2018):

The FPIU noted that it had *"reviewed the report and the achievements recorded for the FPIU of FMWR on 2NUWSRP is accepted".*

Comments by PIU of CRSWBL (received 5th May 2018):

The PIU of CRSWBL had no specific comments, but noted in general terms that:

> *"we generally observe that the report is practical and thoroughly exceptionally professional … Furthermore, I must mention the tremendous support and oversight of the World Bank team, especially of the task team leaders starting with Engr. Hassan Kida and Mr. Camilo, including but not limited to the PFMU under Engr. Benson himself. We appreciate the effort and sacrifice of each one towards coming to this point….Finally, we may need to place on record that from our team review we have no crucial or significant comments or remarks"*

Comments by LSWC (received 7th May 2018):

The LSWC both commented on the ICR in general, and provided specific feedback on the issues of cost recovery, the Public Private Partnership related project component, and an audited financial report. Specifically:

> *"Having carefully perused the draft ICR submitted […] we wish to express our appreciation for the professionalism and the level of details demonstrated in the report."*

Regarding the O&M Cost Recovery, LWSC noted that:

> *"From the report the % O&M cost recovered from revenue evaluation performance rating was 54.4% (but 74.3% with salary subvention) […] However, we hereby re-emphasize the need to reconsider inclusion of the Lagos State Government subventions in the calculations. You may recall that a letter signed by the Honorable Commissioner for Budget and Planning (Lagos State) was sent to the Bank technical support team which indicated the reason for the subvention. It is partly to cater for revenue loss to LWC due to lower tariff i.e. inability to charge cost-reflective tariff in view of the social responsibility of the Government […]*
>
> *The distribution network rehabilitation works executed under the project covers about four (4) Regions, representing about 35% of network service coverage of Lagos Metropolis. The lesson learnt is that there should have been a specific program for reducing the technical losses, as a project component. This will directly impact on percentage coverage area as well as revenue collection."*

Bank Response: The comments are well received and the ICR explicitly acknowledges the impact of the State Government's decision to constrain tariffs in exchange for subsidies in Paragraphs 82 and 83. As noted in Section 3.2.3, the definition of "cost recovery" in the Project Appraisal Document clearly specifies "revenue" to mean "water sales revenue" (World Bank, 2005, p. 4) thus excluding subsidies in line with the project's declared "commercial viability" objective. This definition was not adjusted at restructuring. For coherence with definitions at appraisal, restructuring and implementation monitoring as captured in the Implementation Status Reports, subsidies were thus not included for rating the cost-recovery outcome. As further outlined in Section 3.2.3, and as acknowledged in the feedback by LSWC, the tariff decisions were also not

the only factor in explaining the missed cost-recovery target. For example, persistently high non-revenue water was a key contributing factor in Lagos.

Regarding the PPP Project Components, LWSC noted that:

> *"It is pertinent to mention that the Project made significant effort towards developing a Public Private Partnership (PPP) framework which was shared with the Bank on 2 different occasions. It was reviewed but considered too ambitious for implementation. However, the specific aspect of the PPP framework achieved, in collaboration with the Lagos State Government, was the establishment of Lagos State Water Regulatory Commission (LSWRC) and Office of the Public Private Partnerships (OPPP) [….]*
>
> *With regards to the PPP project component, it is noted that we may have missed it at that point of developing criteria for the rehabilitation of the major waterworks of Adiyan and Iju waterworks, including the intakes. Although the criteria for the pre-qualification exercise focused on engaging experienced and qualified contractors for the rehabilitation works. Perhaps, we should have crafted it to targeted reputable firms/consortia with plant rehabilitation and water operation/management experience to be engaged under a PPP arrangement either – Service or Management contracts for five (5) years duration."*

Bank Response: Thank you for these additional contributions. Note that the LSWRC and OPPP are explicitly acknowledged in the present version of the ICR in paragraphs 43 and 109. Further, LWSC noted that contrary to an Endnote in the draft ICR, an Independent Audited Financial Report for 2017 was available. This has been corrected in the present version of the ICR.

Comments by the Co-financier - AFD (received 4th May 2018):

AFD commented on the report quality as a whole, highlighted the relevance of one of the ICR lessons for ongoing AFD operations in Nigeria and provided further comments within the draft document. Specifically, AFD noted in its summary email:

> *"Thank you very much for this detailed and objective report. Except very few comments and questions that you will find in the document attached, please note that AFD has no particular comments.*
>
> *Among the lessons learned from the program, we have noticed the recommendation about the need to define a realistic reform agenda along with the project activities. We have discussed this matter with Kano during the appraisal of the funding for this State. The Kano government and its water utility agreed to tie the disbursements with the achievements of institutional reform. The operationalization of this proposition shall be further discussed at the project inception. We will share information with the WB in due time."*

Bank Response: All comments and corrections provided by AFD within the draft document were addressed and integrated into the present version of the ICR.

Annex 8: List of Supporting Documents

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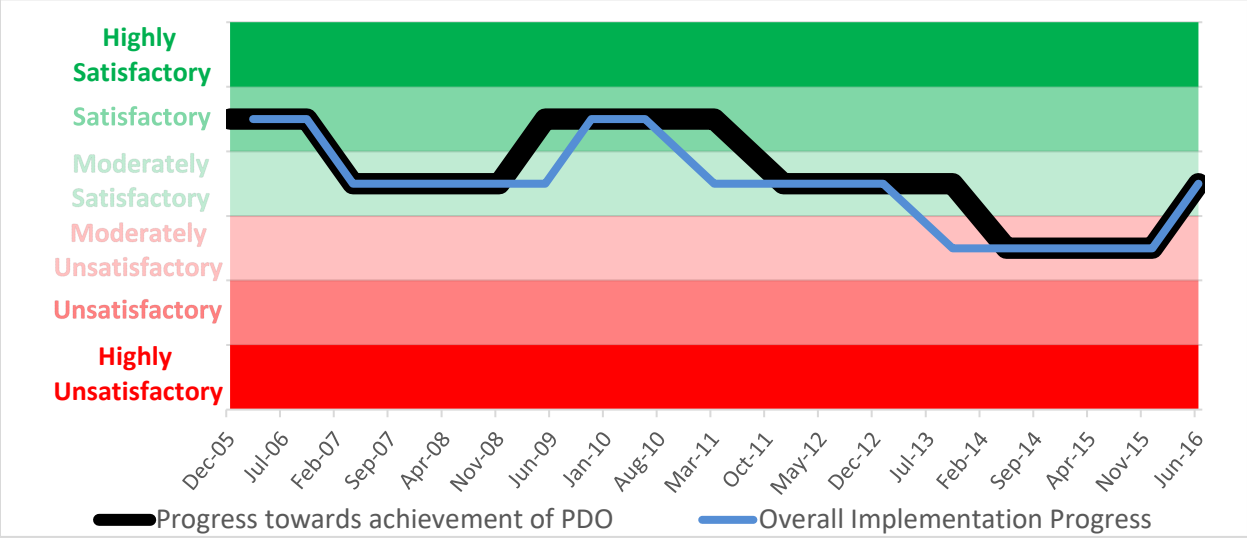
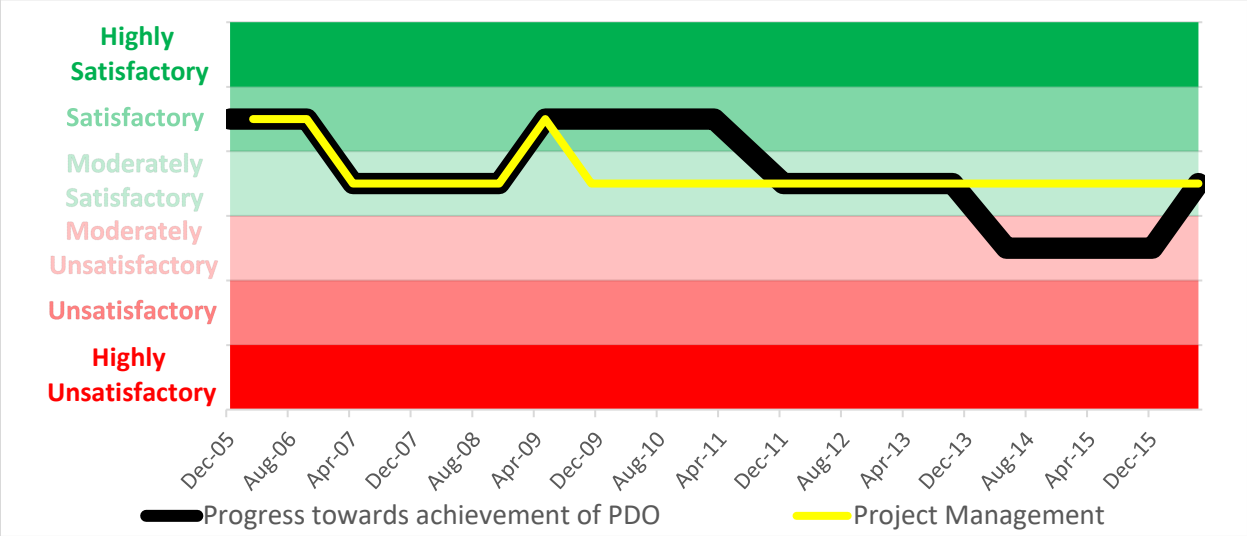
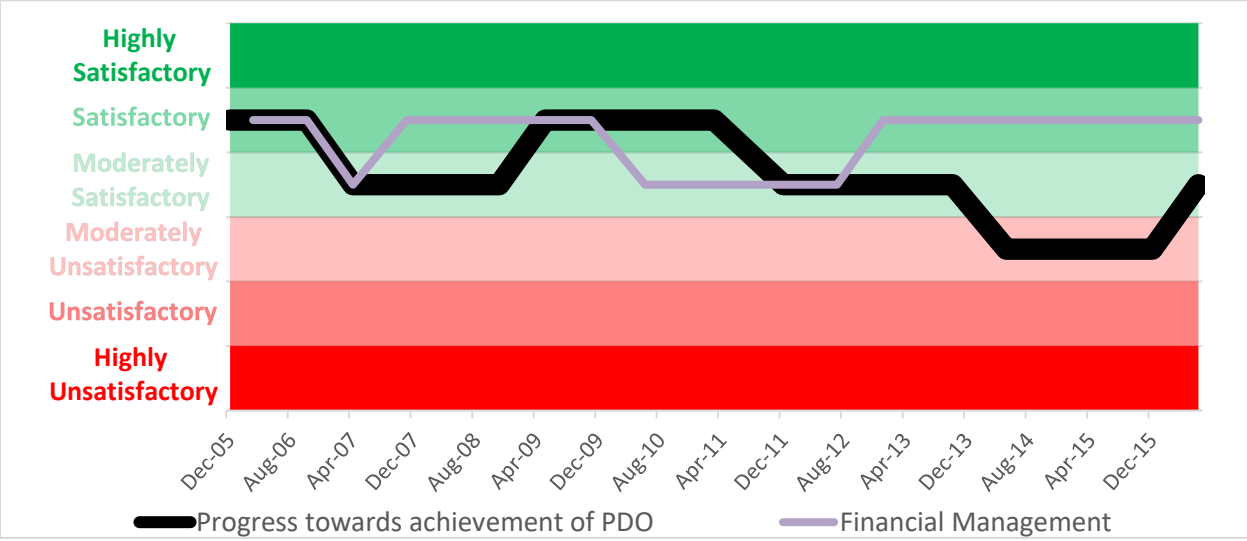
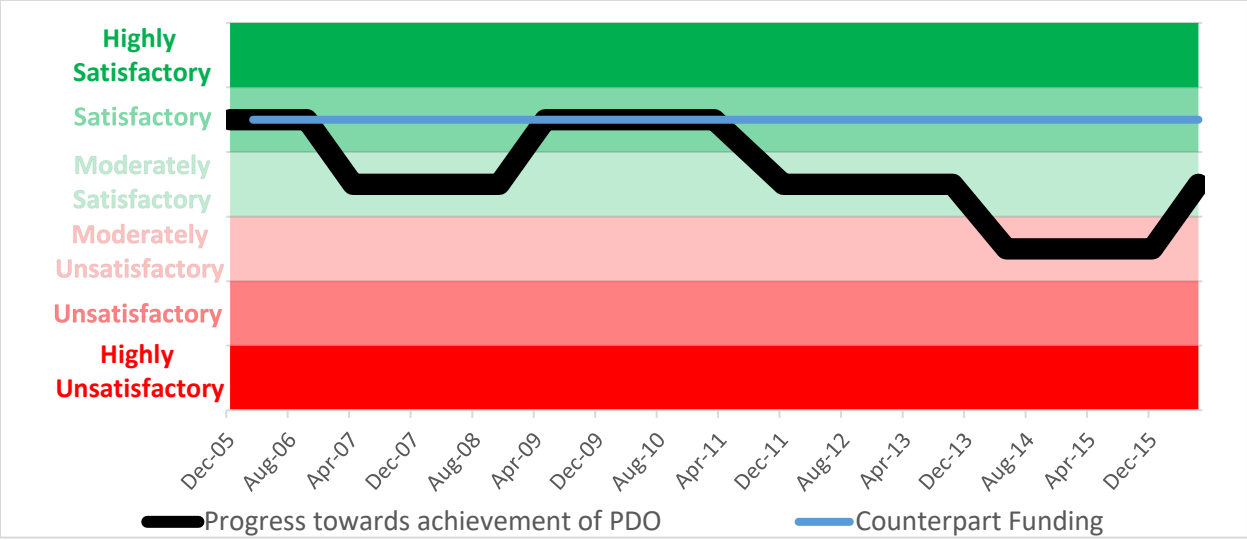
Annex 9: ISR Ratings over Project Duration





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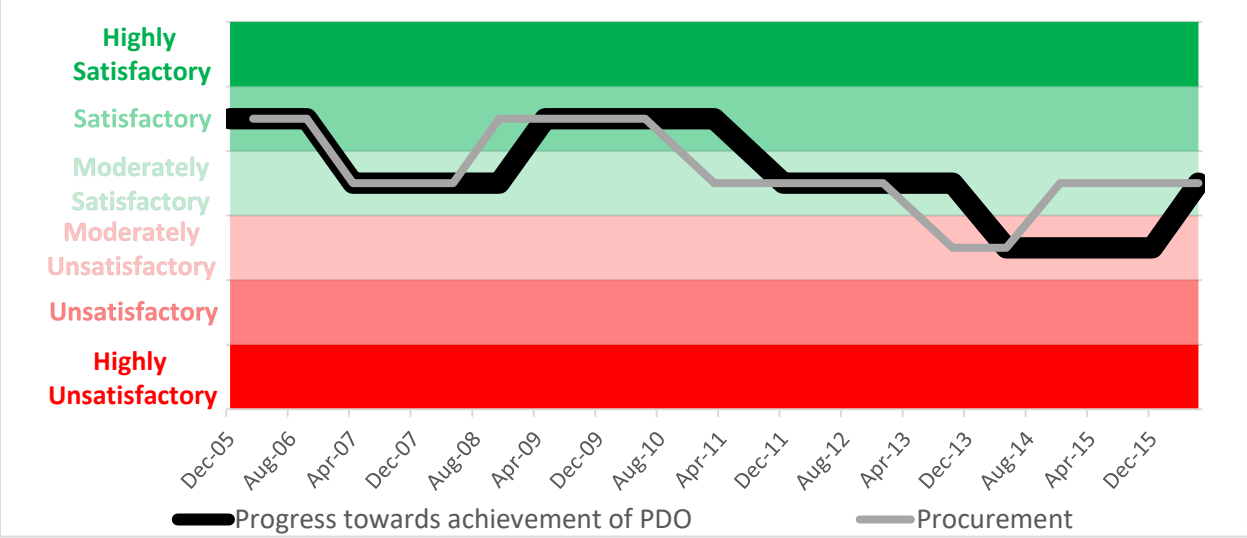
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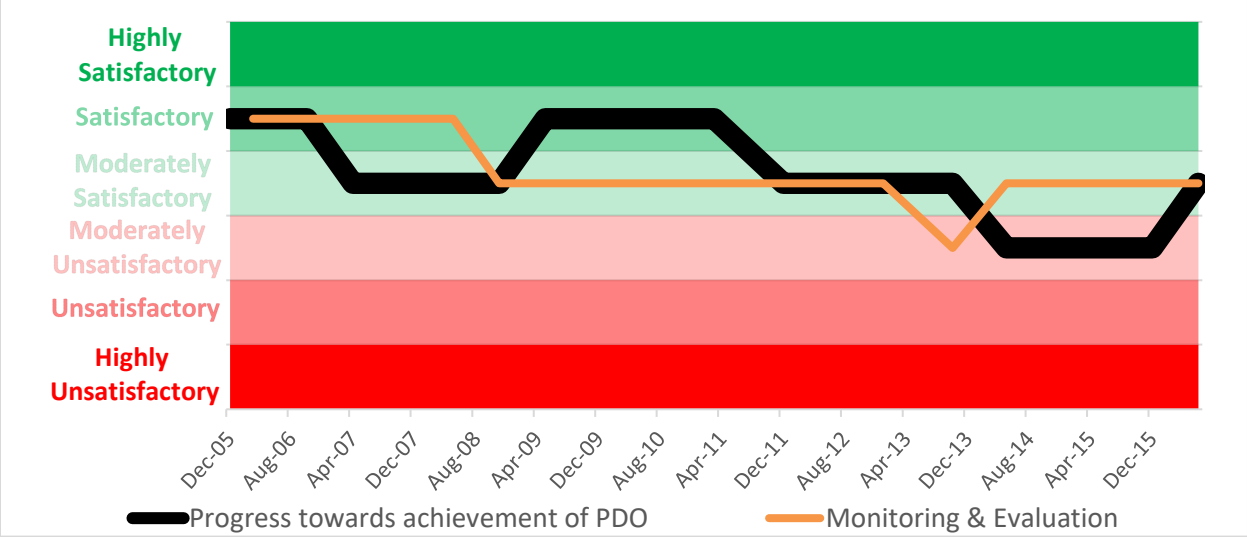
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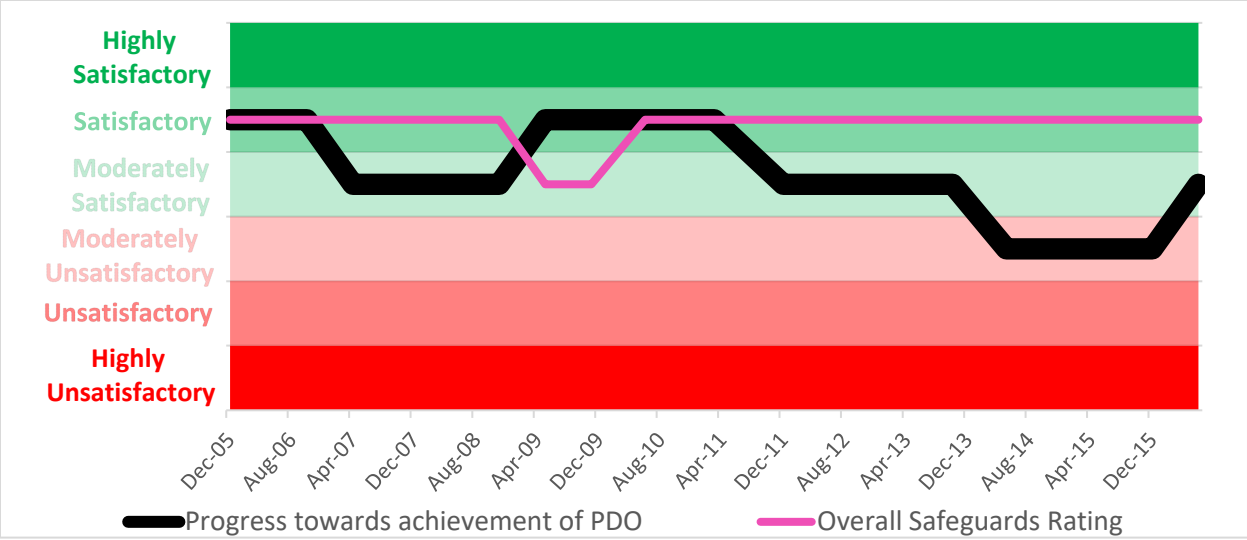
Progress towards achievement of PDO
Monitoring & Evaluation



ISR Ratings of Project Components

ENDNOTES

[1] World Bank WDI, Data series "SP.POP.TOTL" and SI.POV.DDAY (Poverty headcount ratio at $1.90 a day (2011 PSP)

[2] World Bank and DfID, Country Partnership Strategy for the Federal Republic of Nigeria, June 2005; p.vi, p.3;

[3] WDI, Data series "SP.URB.GROW", "SP.URB.TOTL.IN.ZS", "SP.POP.TOTL"; WHO / UNICEF, JMP; DHS1990, DHS2008.

[4] *Ibid*.; p.2;

[5] The approach of NUWSRP2 was informed by eight predecessor projects financed by the World Bank, of which seven were rated unsatisfactory or moderately unsatisfactory, and only the immediate predecessor (NUWSRP1) as moderately satisfactory. From the late 1970s, the World Bank invested over US$ 700 million in urban water supply projects in Nigeria with largely unsatisfactory results. An early focus on infrastructure investments at state level gradually gave way to attempts to combine infrastructure with institutional reform at national and state levels. The NUWSRP2 is not only an important bellwether of the Bank's ability to learn from past mistakes, but also a critical guide to its successor project NUWSRP3, a new IDA credit of SDR 161.6 million signed on 7th November 2014 and expected to close in 2020.

[6] World Bank, Development Credit Agreement, July 15, 2005; Schedule 2, p.26; Credit Nr. 4086. Note that the PDOs in the PAD (Report 31475-NG, 2005; p.4) differ in minor fashion from the Credit Agreement by removing filler words ("the", "state"), adding the specification "in four cities" to objective (ii), and replacing "in Participating States" with the more specific "in Cross River and Lagos States" under objective (iii). The summary description of the PDO and key indicators on the PAD cover sheet differ slightly from the definite form in the main text and technical Annex 3.

[7] Number of additional IDA credit was 5129. Note that an earlier extension of the original credit closing date from June 30, 2011 to May 31, 2013 was carried out without changes to the PDOs or key indicators.

[8] Note that there is an inconsistency as page 20 of the Project Appraisal Document states this target is to be achieved "by June 30,2008.", yet on page 21 in the results matrix achievement of target is scheduled for year 5.

[9] While at first glance base and target of this indicator appear to be the same as in the original PAD, effectively these were *revised upward* by replacing the "for 80% of the time" indicator with "at 100% capacity 24/7" while retaining nominal 85% capacity target

[10] Note that this is a discrepancy in the original PAD document which cites 100% targets in the Results Framework on page 20, but 90% in the overview table on page 21

[11] The Additional Financing paper is inconsistent on this point as even though the Cross-River IRI is dropped (p.21), additional funds to support a PSP in Cross River were allocated (p.9,p.11).

[12] At the time, a disbursement category reallocation was made, but no changes to the results framework.

[13] In particular the "National Water Rehabilitation Fund Project" which closed in 2001 with an "unsatisfactory" rating and had targeted 22 SWAs.

[14] This appears to have been successful at first, though did not present a re-emergence of civil society resistance in 2014-16, when an NGO campaign opposed water PSPs in Lagos. This campaign was led by Environmental Rights Action/Friends of the Earth Nigeria with key support from the American NGO Corporate Accountability International, and gained some local union support. See press reports here: https://goo.gl/sQItlP, https://goo.gl/jePsSC . Project stakeholders viewed this as a contributing though not decisive factor in the ultimate failure of PSP deals to materialize.

[15] Note that Components 1,3 and 4 had funding allocations for tasks to be implemented by the federal FMWR which generally contributed to the overall objectives (e.g. dam maintenance, state technical assistance) but were not captured with separate results indicators

[16] Does not include unallocated amount which would bring the total allocation in US Dollars at Additional Financial stage to USD 400.729m, see AF Project Paper 2012, p.14.

[17] Confirmed by completion certificates of supervisory consultancies for works in Victoria Island, Surulere, Lagos Island / Ikoyi, and final report for works in Ikeja / Oshodi.

[18] See Annex 2 for detailed calculation.

[19] Note that this revised intermediate target of 55,000 new connections is significantly below the revised PDO level target of 99,000 (75,000+24,000) new active connections

[20] In Cross River, at least 74,271 new connections are attributable to the project (i.e. 75,271 active connections reported under the PDO 2 indicator minus the baseline of 1,000 connections), and 26,115 in Lagos. This means at least 100,386 new piped household water connections that are resulting from the project intervention, easily meeting the target of 55,000. [54,55]

[21] In Lagos, rehabilitation works included major restorations of Adiyan and Iju treatment works, along with the rehabilitation and construction of a number of smaller water works (VIPCG, 2016, pp. 121-23). This positively affected at least 35,821 accounts that were active as of December 2017 (2ML Consulting Limited, 2018). In addition, capital investments also improved supply quantity, quality and continuity to at least 75,271 connections in Cross River state, for a total of at least 111,092 household water connections affected by rehabilitation works undertaken under the project.

[22] See Annex 2 for the detailed calculation for this indicator.

[23] The PAD contained an inconsistency here as the first part of the component 3 outcome indicator stated a baseline of "60 million m3/year" but the "Baseline Value" given just next to it was "65M" (World Bank, 2005, p. 21). Similarly the target in writing is 180 million m3/year, but in the results monitoring table it is given as 181 million m3/year.

[24] LSWC provided production figures indicate that after the completion of project financed repairs in November 2017, available capacity had been restored to 118 million gallons per day from the Adiyan, Iju and Isashi plants, equivalent to over 16 million m3 per month, or equivalent to 200 million m3 per year. The completion of the required repairs is confirmed in the supervisory consultancy report (Enviplan, 2017).

[25] See Annex 2 for details on "Citizens Financial Responsiveness Project" implemented by the "Nigeria Network of NGOS (NNNGO) in Lagos, LSWC helpdesks and Cross River "Public Communications Programme Action Plan"

[26] Yes as per ICR visit and BCR (VIPCG, 2016, p. 17). See Annex 2 for additional details.

[27] Yes as per BCR (VIPCG, 2016, p. 17). See Annex 2 for additional details.

[28] As per data shared directly by LSWC with the ICR team (Excel file "Utility Data and Information (UPDATED sunny 2).xlsx"). For 2017, the utility has reported total collections of Naira 1,630,343,778 compared to total billings of Naira 2,356,347,680 i.e. a billing collection rate of 69%. See Annex 2 for additional details.

[29] As per revenue data for January to December 2017 shared by CRSWBL (Excel file "Utility 2017 M&E UPDATED DATA.xls"). See Annex 2 for additional details.

[30] The project only supported two SWAs/utilities, and never intended to support more. It is not clear why this indicator was set to six, possibly due to confusion of "towns" with "utilities", but nominally, as it is, the indicator was not achieved.

[31] See for instance (AIM Consultants Limited, 2017), (Enviplan, 2017), (2ML Consulting Ltd, 2018), (2ML Consulting Ltd, 2017), (CIWAT Engineering Consultants, 2017), (CKW Environment Ltd, 2017), (World Bank, 2017).

[32] Cost overruns in Ikom and Ogoja alone amounted to an estimated US$ 66.7 million at additional financing stage (World Bank, 2012, p. 8)

[33] Project stability and continuity was not helped by frequent changes in the World Bank team, with five different Task Team Leaders over the project duration: Alex A. McPhail (preparation to 2007), Joseph A. Gadek (2007 to 2009), Andrew Makokha (2009 to 2011), Hassan Kida (2011 to mid-2016), Camilo L. Cordoba (since mid-2016).

[34] The revision at additional financing corrected a lack of balance in the original PDO indicators as the Cross River site was originally not included under the first PDO ("reliability of water supply"), while Lagos was not included under the second PDO ("increase access to piped water"). The revision also simplified a PDO indicator deemed to be unclear (1a in Table 1), dropped two indicators viewed as not achievable (3a Table 1 and 2b in Table 2) and corrected an inconsistency in the original PDO targets (see Endnote XIV). A set of Bank core indicators was also added.

[35] An example of unclear or contradictory information provided by project M&E at IDA project closure is when the final ISR reported a value of 85% for PDO indicator Lagos Treatment Works Operation Capacity on 31st May 2016 (World Bank, 2016, p. 11), but a presentation by LSWC reported only 60% in the first half of 2016 (LSWC, 2016, p. 11), while the final Borrower Completion Report (BCR) recorded a value below 36% for the first half of 2016 (VIPCG, 2016, p. 112). Note that this was prior to the major project funded repairs in 2017 that did restore operation capacity to above 80%. Similarly, the final number for the PDO indicator of "direct beneficiaries" (Table 1, 2c) was variously given as 1,200,000 (World Bank, 2016, p. 9), 4,866,836 (VIPCG, 2016, p. 15) and 2,931,356 (VIPCG, 2016, pp. 140-41). Similarly, earlier in the project inaccurate figures were reported. For example, the Implementation Status Report Sequence 14 reported 82,000 "New piped household water connections that are resulting from the project "intervention" as "Current", of which 50,000 in Lagos, although even at project end the Lagos figure was less than 30,000 (see Table 1 and associated references). Concerns about M&E quality were raised in ISRs by the Country Management Unit immediately prior to IDA closure (World Bank, 2015, p. 14). To evaluate final outcomes of this ICR, the team had to undertake considerable effort to verify data directly from sources and recalculate unclear figures as the project M&E framework itself often yielded contradictory results.

[36] However, following an INT review, one company was debarred due to submitting false documentation in a bid (World Bank, 2016)

[37] For example the external audit for 2015 was judged "less than satisfactory as most figures in the report did not reconcile with any of the financial records in the project" (World Bank, 2016, p. 6).

[38] Specifically, NGN 53,874,965.62 (US$176,639.23), US$11,650 and Euro 40,000. A budget over-commitment had occurred during the predecessor project NUWSRP1, a lesson that appears to not have been learned in spite of explicit warnings by the CMU in ISR comments prior to closure (World Bank, 2014, p. 9) (World Bank, 2015). In the penultimate ISR in late 2015, the Country Program Coordinator noted: "it is important that the project's closure is not hampered by issues related to Financial Management or Procurement. We would like to be absolutely clear on any cases of unretired expenditure, ineligible expenditures, efficiency of the internal control systems etc. In particular, the project team is kindly asked to ensure that the Lagos and CR state governments take full responsibility for paying due balance for all contracts that will not be completed by the project closing date. This is to avoid the risk of state governments not paying contractors after project closure, as has been the case on several other projects." At the time of writing of the ICR, the AFD team anticipated that a pending final audit of the AFD financing may find additional funds not exceeding $2.214 million ineligible and subject to cancellation and reimbursement.

[39] Due to the near identical pre- and post-revision ratings, there is no practical impact of weighting of ratings. Nevertheless, it can be noted that the additional financing was approved on 19th June 2012 at which point 35% of the total credits (4086, 5129, CNG1007 01) had been disbursed (historic and final disbursements of IDA credits 40860 and 51290 as per Client Connection. As the AFD credit CNG1007 01 was not closed at the time of writing, the original credit allocation was used US$ 77,730,000).

[40] The Vision 2020 also emphasizes "encouraging…Private Sector Participation (PSP) and Public Private Partnership in the provision of water supply" which, though not captured in the PDOs of the project, was a core part of the project strategy at appraisal and captured as intermediate results indicators (Table 2)

[41] The CPS for FY14-FY17 is in the process of being extended to 29th June 2019 with an expected board date in May 2018 as confirmed by the office of the Country Program Coordinator, AFCNG.

[42] See Table 1 for a precise list of PDOs and associated indicators

[43] A recent World Bank study on "Providing Water to Poor People in African Cities Effectively" showed that in "the cities where the poor are served well, traditional utilities are the main service providers to the poor…These utilities have in common that they are effectively managed, having high operating cost coverage ratios and scoring well on other measures of efficiency and cost effectiveness" (World Bank, 2016).

[44] The appraisal analysis had clearly highlighted that "major structural reform is needed", as did the CPS which sees the Bank's role as a "main interlocutor with the authorities on … water sector reform" to "promote synergies between state level reforms and federal awards of investment support. The government's NEEDS strategy had also emphasized the need to "reform" and "fundamentally" reorient the "provision of services" to allow state utilities "more autonomy and increasing commercialization through service, management, and lease contracts with private firms".

[45] Though the main PDO-level PSP objective for Lagos was dropped (as well as an intermediate indicator for Cross River state), additional funds were allocated to support a PSP unit at the Federal Ministry of Water Resources and an intermediate results indicator related to PSP in Lagos was retained (see Table 2).Note that, inconsistently, the Project Paper allocated funds to "Cross River PPP operator fees" even though the associated Cross River PSP indicator was dropped at restructuring (only for Lagos a PSP intermediate indicator was retained, see Table 2) The project, however, ultimately did not disburse for Cross River operator fees (there was a private operator in Calabar, however, not project supported, see Annex 2).

[46] Source: Available capacity and production data for the project-supported water plants of Adiyan, Iju and Ishasi for the year of 2017 were provided directly by LSWC in Excel files. A report by the consultancy firm 2ML, which led a performance improvement program in Lagos, also confirms these figures for the second half of 2017 (2ML Consulting Ltd, 2018, p. 24). Conflicting lower water production figures in a different section of the same 2ML report were explained as a mistake upon questioning by the ICR TTL. Note that the aggregate realized operational capacity figure was calculated by dividing total actual production of all three plants by total actual design capacity of all three plants, not by calculating realized operational capacity for each plant separately and then averaging it (as done in the 2ML report on page 25) which would unduly over-emphasize the relatively weaker performance in the Ishasi plant, which is by far the smallest, contributing only 3.3% of the total design capacity of all three plants. The completion of the repair works that justify the rapid increase of realized operational capacity in the final month of AFD co-financing (December 2017) are confirmed in the report of the supervisory consultancy (Enviplan, 2017).

[47] Note that the original PDO 1 capacity realization target was slightly different, aiming for at least "85% capacity realization 80% of the time". The PAD did not specify a clear interpretation of "80% of the time", but if looked at on a day-by-day basis, then in the final month of 2017, the three project supported plants reached a realized operational capacity above 85% on 15 out of 31 days i.e. "48% of the time", and above 75% on 25 days i.e. "80% of the time". All of the days above 85% are in the second half of the month following conclusion of repair works. Thus, the project nearly achieved its original objective or is at least likely to do so going forward.

[48] Source: Hours of supply data for Adiyan, Iju and Ishasi for the year of 2017 were provided directly by LSWC in Excel file upon request of the ICR TTL. As with the reported matching improvement in realized operational capacity, the key reason are the repairs confirmed completed in the supervisory consultancy report (Enviplan, 2017). Earlier horus of supply data from 2016 reported in the BCR (VIPCG, 2016, p. 14; p.82) have thus become outdated.

[49] Source: The Excel sheet with calculation of hours of water supply provided by utility in December 2017 indicates an average of 19.28 hours of supply in Calabar and an average of 17.76 hours in the other Cross River towns and subsystems supplied by the utility. Note that this was confirmed by a World Bank consultant who inspected the secondary sites in an email dated Tuesday, March 13, 2018.

[50] Source: BCR (VIPCG, 2016, p. 82; p.108).

[51] The repair contract was STEP activity No. LSWC/2NUWSRP/LIB/WKS/93 with a volume of USD 2.58 million. The final report and completion certificate by the supervisory consultancy were available (Enviplan, 2017). The performance improvement program was guided by the specialized consultancy firm 2ML.

The restoration of regular energy supply in Lagos in the second half of 2017 was possible due to three factors: Firstly, the Adiyan water plant was reconnected to the power grid in October 2017 after payment of power bills. Secondly, the State Government has met its financial obligations to the "Independent Power Plants" (i.e. separate from the electricity grid), which also supply the major treatment works. Thirdly, improved political stability in southern Nigeria has reduced militant attacks on pipelines which had disrupted gas supply to the IPPs in 2015-16. Lagos State Government payment of arrears to the public energy supply company IKEDISCO and the IPP provider was stated directly by LSWC to the ICR author by email and is also confirmed in the Aide Memoire of the December 2017 implementation support mission (World Bank, 2017, p. 3). A signed internal LSWC memo (Ref. No: ADYW/9/S.2/297) confirming grid-reconnection of the Adiyan plant and partial arrears payment was also provided.

[52] Signed letter of commitment to power utility PHEDC shared with ICR team. Payment and reconnection confirmed in Aide-Memoire of last supervision mission (World Bank, 2017, p. 5). Repair activity in Calabar was done under Activity No. CR/II NUWSRP/NCB/SWKWTPRE/2017/001.

[53] The utility reported only 65,350 connections to the ICR mission in November 2016 (the shared data has a range of 63,720-65,350, but the higher figure was used), and accounting for 10,402 suspended connections and 4,747 connections destroyed by roadworks, the best estimate of active connections at the time was 50,201.

[54] Sources: Final overall figure of active connections reported by utility in Excel sheet shared directly by CRSWBL in January 2018 ("Utility 2017 M&E UPDATED DATA.xls") as well as screenshots of internal customer databases for each site. Progress was also confirmed by Aide-Memoires of supervision missions in July and December 2017 as well as an August 2017 report co-authored by the 2ML consultancy firm (2ML Consulting Ltd, 2017). The new Okpoma connections are further confirmed in SGI supervisory consultancy report (SGI Consulting Engineers, 2017, p. 5); Obubra connections confirmed in AIM supervisory consultancy report which notes a slightly lower number of 3,850 at the time of report publication, but points out that final works are still ongoing; hence the full number was used, which was also confirmed by the utility (AIM Consultants Limited, 2017, p. 26). The repair of connections destroyed by roadworks and "regularization" of connections suspended earlier in Calabar are reflected in a signed internal memo of CRSWBL dated 14th November 2017 that was shared with the ICR team. Most connections in Ikom were included in the 50,201 figure already.

[55] Source: As reported by the utility. To verify the figures, the ICR author also reviewed supervision consultancy reports and completion certificates for AFD financed Lots 1 to 4 (a total of 17,811 connections) for which Excel files with addresses and GPS locations were also provided (CIWAT Engineering Consultants, 2017) (CKW Environment Ltd, 2017). The original 6,544 connections financed by IDA were confirmed in the BCR (VIPCG, 2016, p. 13). The additional connection of 1760 meters by LSWC is at least significantly attributable to the IDA project as it used meters procured by the project and was informed by the project financed 2ML performance improvement consultancy. The utility reported these meters as active, and provided at least partial billing system extracts as proof. The 2ML Consultancy report stated a total of 35,821 active household customers in December 2017, though not all due to the project (2ML Consulting Ltd, 2018, p. 15).

[56] Source: Beneficiary figures in the last ISR (World Bank, 2016), which cites 1,200,000 beneficiaries, and the BCR which gives up to 4,866,836 (VIPCG, 2016, p. 15) both exceeded the target even prior to the AFD financed improvements in the last project year. However, neither source discusses how these figures were calculated. For confirmation, the ICR thus re-calculated the number based on the minimum known number of active connections that could have conceivable benefited (i.e. new connections and more reliable service on old connections). In Cross-River, active individual connections were 75,271 (see table 1, Endnote 54), in addition the project also constructed 414 public water kiosks. With an average urban household size of 4.2 (DHS 2013), and each kiosk serving 300 persons on average, this yields 418,794 beneficiaries. In Lagos, the total number of active individual accounts is reported to be 35,821 (see Endnote 55) and the utility also reported at least 866 water vendors, 9,227 commercial/industrial and 1,975 government/academic/hospital accounts (not constructed by project; reported in database extract 2016). Assuming 4.2 beneficiaries per household, 300 per water vendor, and 20 per commercial or government account, we obtain a total of 690,298 beneficiaries in Lagos, and 1,074,626 overall. This figure may be considerably higher in practice due to common account-sharing between households, or illegal reselling of the substantial non-revenue water,

which would also lead to additional "beneficiaries" of improvements in water quantity, quality and continuity attributable to the project even if these are not formal customers.

[57] The percentage of female beneficiaries as reported in the ISR (World Bank, 2016) and BCR (VIPCG, 2016) was not measured. It appears to have been simply assumed that at least 50% of beneficiaries are female in line with 51% women in the general population (DHS 2008). Note that the Beneficiary Impact Survey found only 45% of beneficiaries were female in either location (VIPCG, 2016b, p. 5), but as the survey's sampling methodology is not well explained, and no confidence intervals given, this is likely to be statistical error, and the ISR/BCR figures are thus used. As households were the primary beneficiaries of the intervention, and because women are typically more likely to be tasked with water collection, it is sensible to assume that at least 50% of beneficiaries were female in light of DHS (Demographic and Health Survey) statistics on the general distribution of gender in households.

[58] The reconciled revenue and expenditure sheet for 2017 shared by CRSWBL shows total revenue collection from water sales of NGN 272,771,339 compared to NGN 658,242,715 in total expenditures in 2017 (note that the original data shared had wrongly summed billings and expenditures, which the ICR corrected). The BCR had cited 36% cost recovery in mid-2016 (VIPCG, 2016, p. 108). The last ISR cited 45% in May 2016 (World Bank, 2016), though without providing clear documentation. In all scenarios, the target was clearly missed. As outlined in the main body, the utility received regular subsidies from the state for salaries – a total of NGN 213,020,192 over 2017, which rises to NGN 244,020,192 if chemical and power subventions are considered. If these subsidies are understood as fixed, regular income that counts towards cost-recovery, it would raise cost recovery to 73.8% and 78.5% respectively.

[59] Note further that cost-recovery was assessed on the basis of *actual revenue collections*, not billed revenue as the PAD clearly refers to costs "*collected"* from revenue (World Bank, 2005, p. 6). This is also in line with reporting practice by the utilities and in the ISRs throughout the project duration and with the related intermediary results indicator relating to the billing collection rate. Moreover, it is clearly the meaning of the underlying commercial viability objective, which cannot be achieved on uncollected billings.

[60] Letter by the Lagos State Government (Permanent Secretary, Ministry of Economic Planning and Budget) to the project Task Team Leader. Reference number MEPB/B.2016/S.20B/XXXIV/98.

[61] Cost-recovery figures from utility data sheet shared by LSWC. For reasons outlined in Paragraph 81 and Endnote 59 only water revenue collections were considered, not billings or subsidies. With salary subsidies by the state the cost-recovery figure would be 74.3%, and counting chemical and energy subsidies, 134%. Mid-2016 cost-recovery figure from Income-Expenditure sheet shared by LSWC for January-June 2016. Matches BCR figure (VIPCG, 2016).

[62] The positive NPV for Lagos seems to have been partially a result of a calculation error. Incremental expenses were calculated on the basis of "incremental water available for sale" instead of "incremental water produced" (prior to unaccounted for water losses). The cost of incremental production, however, primarily depends on the incremental volume of water produced, rather than the incremental volume of water actually sold, because even the production of non-revenue water attracts costs. If incremental expenses are calculated on the basis of incremental water production costs, NPV in the original base model is negative *ceteris paribus*.

[63] See Section 1.6 and Tables 1 and 2. Per-output costs rose for key indicators captured both in pre- and post-revision results-framework. For example, while the connections target for Cross River state was raised from 50,000 to 75,000, funding allocations rose disproportionately from an original Cross-River allocation of US$ 50 m (World Bank, 2005, p. 31) to an actual disbursement of US$ 137m from IDA funds alone (as per Client Connection data) i.e. from approx. US$ 1,000/connection to over US$1,800 per connection. Per connection costs would be higher still if AFD funds are taken into account which constituted an additional allocation of US$ 43.9m (World Bank, 2012, p. 11). In Lagos, the attributable capacity improvement target rose slightly from 116m m3/year to 120m m3/year (see Table 2), but allocations to Lagos rose from an original US$150m (World Bank, 2005, p. 31) to approx. US$170m including AFD allocations i.e. from $1.3m per million m3/year to $1.4m, while the number of distribution districts to be rehabilitated in Lagos was reduced from five to four. Allocations to other activities (e.g. the MDG tracking system under Component 4) also rose significantly (in the case of the tracking system US$ 5m) without a change in the target.

[64] As detailed in Annex 3, a negative net-present value is obtained even if data gaps are filled using optimistic assumptions such as 30% non-revenue water, the lowest available figure for pre-rehabilitation production (i.e.

maximum incremental production), tariff increases from 2017 and the low original assumptions for cost per cubic meter, and using permissive assumptions of the original model such as perfect revenue collection.

[65] Note that at entry the model for Cross River was limited to Calabar. This NPV calculation at ICR is also done for Calabar, though production and revenue data is from all sites due to the lack of disaggregated data. Until 2016 the entire incremental revenue came from Calabar as confirmed by M&E data shared by the utility. At additional financing, the original financial model for Lagos and Calabar was not explicitly revised, but complemented by estimates for five towns in Cross River for which additional funds were allocated. A comparable ex-post re-estimation is not possible for these as the financial models and assumptions were not archived WBDocs and could not be traced by former project team members upon request. However, as over 70% of investment costs in Cross River were concentrated on these towns, while virtually no revenues were collected there prior to 2016, a negative financial NPV in the original timeframe can be assumed.

[66] This is also illustrated by the fact that additional financing was already being considered necessary before major works even started see e.g. ISR Sequence 8 (2008). See also post-MTR status report (World Bank, 2009).

[67] It should be noted that the Nigerian National Bureau of Statistics figures used here (NBS, 2017, p. 5) are slightly outdated (from 2009-10). A more recent World Bank report using data up to 2012-13 found slightly lower rates for consumption poverty in Cross River (51%) and particularly Lagos (13%), though noted that even Lagos concentrates hundreds of thousands below the poverty line due to its high overall population (World Bank, 2016b, pp. 45-46).

[68] The beneficiary survey carried out as part of the Beneficiary Impact Study Report suggests an elevated socio-economic profile with 53% and 64% of beneficiaries reported to have tertiary education in Lagos and Cross River State, respectively, compared to less than 30% and less than 15% in the general population of the states, respectively (NPC, 2008). In both states a majority of the beneficiaries were reported to earn more than Naira 50,000 per month (VIPCG, 2016b, p. 25).

[69] Author's calculation; DHS 2008.

[70] The universities were the Ahmadu Bello University Zaria, Federal University of Agriculture, Abeokuta, University of Calabar, University of Ilorin, University of Maiduguri, University of Nigeria Nsukka. Comprehensive information on course particulars or student numbers were not available.

[71] Note that at closure of IDA financing in mid-2016, the majority of PDO targets had been missed, but this was not accurately reported by Bank M&E at the time. Some key PDO indicator values were inaccurately and pre-maturely reported to be met, contributing to a problematic upgrade of the ISR project rating. In the very last ISR Sequence 21 (archived after project closure in June 2016) the overall project ratings were upgraded from "moderately unsatisfactory" (the rating of last ISR before before Closing/Inactive status) to "moderately satisfactory". This was done primarily on the strength of allegedly fully meeting targets for realized operational capacity, hours of supply and new active connections in Cross River state. The best available evidence, however, suggests these were not in fact met at the time as this was only achieved later in 2017 (see Section 3.2 and associated notes). Note that in the preceding ISR Sequence 20, the Country Program Coordinator had suggested that if these indicators were not met a downgrade of the overall rating to unsatisfactory rather than an upgrade to moderately satisfactory may be in order: "The reported progress on the number of hours of water supply per day in CR and Lagos, however, suggests that the first sub-objective (reliable water supply) may also not be achieved. We would please ask the team to clarify as that may influence the rating for PDO (if two out of three are not likely to be achieved, it may be difficult to sustain MU rating for PDO)." (World Bank, 2015). Note also that there appears to have been confusion about the indicators among the Bank team at times – for example, a filed Aide-Memoire from May 2016 claims with respect to Calabar that "Now that the works are completed we have achieved the target of this indicator having connected 71,720 house connections". However, the PDOs explicitly referred to new *active* connections, which were lower due to disconnections and connections destroyed by roadworks, and in any case, the target was 75,000.

[72] This was reflected in the original credit agreement Article III as well as Schedule 1 specifying that only 95% of expenditures would be financed by IDA (IDA, 2005)

[73] The reallocation notice makes no specific mention of this, but the percentage of activities to be financed out of the proceeds of the credit was raised to 100% from the 95% in the original credit agreement, thus implicitly eliminating the borrower contribution. This was subsequently upheld in the amended credit agreement (IDA, 2013).

[74] For instance, the original target of rehabilitating the network in five distribution districts in Lagos had to be reduced to four even with additional financing.

[75] Sources; ICR field mission interviews with VIPCG (authors of BCR), former TTL of project, LSWC staff and management, and ISRs;

[76] It should be noted that the Project Paper for additional financing inconsistently allocated $2.5m for "Cross River PPP operator fees" (p.11) even though the IRI to have an operator was dropped in the same document.

[77] See e.g. here: https://nwri.gov.ng/nwrcbnet (2/7/2017)

[78] Note that the positive result is possible despite the overall lack of cost-recovery in the projection of 2017 performance forward due to the model only considering *incremental* costs and revenues, thus excluding substantial overheads (e.g. existing staff costs)

[79] Data provided directly by CRSWBL in an Excel sheet in January 2018 (Utility 2017 M&E UPDATED DATA.xls)