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Report No: ICR00004571

IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(IBRD-79250)

ON A

LOAN

IN THE AMOUNT OF EUROS25.9 MILLION AND US\$8.6 MILLION  
(US\$43 MILLION EQUIVALENT)

TO THE

Office National de l'Electricité et de l'Eau Potable (ONEE)

WITH THE GUARANTEE OF THE  
KINGDOM OF MOROCCO

FOR THE  
MOROCCO OUM ER RBIA SANITATION ( P098459 )

November 30, 2018

Water Global Practice  
Middle East And North Africa Region

## CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2018)

Currency Unit = Moroccan Dirham (MAD)

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MAD 9.49 = US\$1

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US\$1.42 = SDR 1

### FISCAL YEAR

January 1 – December 31

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## ABBREVIATIONS AND ACRONYMS

AM	Aide Memoire
BOD	Biochemical Oxygen Demand
BP	Bank Policy
COD	Chemical Oxygen Demand
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DGCL	Local Authorities General Directorate ( <i>Direction Générale des Collectivités Locales</i> )
DPL	Development Project Loan
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ERR	Economic Rate of Return
ESMP	Environmental and Social Management Plan
FM	Financial Management
GOM	Government of the Kingdom of Morocco
GRM	Grievance Redress Mechanism
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion and Results Report
IP	Implementation Progress
IR	Involuntary Resettlement
ISR	Implementation Status and Results
LA	Loan Agreement
MAD	Moroccan Dirham
MDG	Millennium Development Goals
MENA	Middle East and North Africa
MTR	Mid-term Review
M&E	Monitoring and Evaluation
NPV	Net Present Value
O&M	Operation and Maintenance
OCP	<i>Office Chérifien des Phosphates</i>
ONEE	National Electricity and Potable Water Office ( <i>Office National de l'Electricité et de l'Eau Potable</i> )
ONEP	National Potable Water Office ( <i>Office National de l'Eau Potable</i> )
OP	Operational Policy
PAD	Project Appraisal Document
PAP	Project Affected Persons
PDO	Project Development Objective
PNA	National Sanitation Program ( <i>Programme National d'Assainissement</i> )
PPP	Purchasing Power Parity
REPI	Real Estate Price Index
RF	Results Framework
SD	Sustainable Development
SDR	Safeguards Documents Review
SEEE	State Secretary of Water and Environment ( <i>Secretariat d'Etat pour L'Eau et l'Environnement</i> )
TA	Technical Assistance
TSS	Total Suspended Solids
TTL	Task Team Leader
UASB	Upflow Anaerobic Sludge Blanket
UCS	Use of Country Systems
WWTP	Wastewater treatment plant



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**DATA SHEET**

**BASIC INFORMATION**

**Product Information**

Project ID	Project Name
P098459	Morocco Oum Er Rbia Sanitation
Country	Financing Instrument
Morocco	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	Partial Assessment (B)

**Organizations**

Borrower	Implementing Agency
Office National de l'Electricité et de l'Eau Potable (ONEE)	Office National de l'Electricité et de l'Eau Potable (ONEE)

**Project Development Objective (PDO)**

Original PDO

The objectives of the Project are to: (i) increase access to sewerage services and reduce wastewater-related pollution in selected towns in the Project provinces of Azilal, Benimellal, Khourigba, Safi, Yousoufia and Settat; and (ii) pilot non-conventional technologies for wastewater systems in selected locations.

Revised PDO

The objective of the Project is to increase access to sanitation services and reduce wastewater-related pollution in selected small and medium towns in the Project provinces.



**FINANCING**

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
<b>World Bank Financing</b>			
IBRD-79250	43,000,000	43,000,000	37,511,569
<b>Total</b>	<b>43,000,000</b>	<b>43,000,000</b>	<b>37,511,569</b>
<b>Non-World Bank Financing</b>			
Borrower	32,100,000	32,100,000	32,100,000
<b>Total</b>	<b>32,100,000</b>	<b>32,100,000</b>	<b>32,100,000</b>
<b>Total Project Cost</b>	<b>75,100,000</b>	<b>75,100,000</b>	<b>69,611,569</b>

**KEY DATES**

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
15-Jun-2010	15-Feb-2011	27-Jan-2014	31-Dec-2015	31-May-2018

**RESTRUCTURING AND/OR ADDITIONAL FINANCING**

Date(s)	Amount Disbursed (US\$M)	Key Revisions
09-May-2013	.17	Change in Implementing Agency Other Change(s)
13-Jun-2014	2.57	Change in Project Development Objectives Change in Results Framework Change in Components and Cost Reallocation between Disbursement Categories Change in Safeguard Policies Triggered Change in Legal Covenants
30-Sep-2014	4.64	Change in Loan Closing Date(s)
23-May-2017	28.11	Change in Results Framework Change in Loan Closing Date(s) Reallocation between Disbursement Categories Change in Implementation Schedule





**KEY RATINGS**

<b>Outcome</b>	<b>Bank Performance</b>	<b>M&amp;E Quality</b>
Moderately Satisfactory	Moderately Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

<b>No.</b>	<b>Date ISR Archived</b>	<b>DO Rating</b>	<b>IP Rating</b>	<b>Actual Disbursements (US\$M)</b>
01	30-Jun-2010	Satisfactory	Satisfactory	0
02	10-May-2011	Satisfactory	Satisfactory	0
03	09-Jan-2012	Satisfactory	Moderately Satisfactory	0
04	22-Aug-2012	Moderately Satisfactory	Moderately Unsatisfactory	0
05	18-May-2013	Moderately Unsatisfactory	Moderately Unsatisfactory	.17
06	13-Oct-2013	Moderately Unsatisfactory	Moderately Unsatisfactory	.17
07	07-Dec-2013	Moderately Unsatisfactory	Moderately Unsatisfactory	.42
08	15-Apr-2014	Moderately Unsatisfactory	Moderately Satisfactory	1.47
09	28-Jun-2014	Moderately Satisfactory	Moderately Satisfactory	2.57
10	08-Dec-2014	Moderately Satisfactory	Moderately Satisfactory	6.01
11	01-Jun-2015	Moderately Satisfactory	Moderately Satisfactory	9.00
12	18-Nov-2015	Moderately Satisfactory	Moderately Unsatisfactory	14.24
13	25-Feb-2016	Moderately Satisfactory	Moderately Unsatisfactory	17.89
14	15-Jun-2016	Moderately Satisfactory	Moderately Satisfactory	20.07
15	15-Dec-2016	Moderately Satisfactory	Moderately Satisfactory	22.83
16	14-Jun-2017	Satisfactory	Moderately Satisfactory	28.61
17	20-Nov-2017	Satisfactory	Moderately Satisfactory	30.14
18	24-May-2018	Satisfactory	Satisfactory	37.18



**SECTORS AND THEMES**

**Sectors**

Major Sector/Sector (%)

**Water, Sanitation and Waste Management 100**

Sanitation 94

Public Administration - Water, Sanitation and Waste Management 6

**Themes**

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

**Urban and Rural Development 98**

Urban Development 98

Services and Housing for the Poor 98

**Environment and Natural Resource Management 3**

Environmental Health and Pollution Management 3

Air quality management 1

Water Pollution 1

Soil Pollution 1

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## I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

### A. CONTEXT AT APPRAISAL

#### Context

1. Before the project, in Morocco, an estimated 76 percent of households in large cities (population greater than 100,000) were connected to sewer networks, whereas in small and medium cities, less than 40 percent of households were connected. Additionally, existing sewer networks commonly overflowed during the rainy season and existing wastewater treatment capacity only covered about 8 percent of the volume of collected wastewater. Further, the Government of the Kingdom of Morocco (GOM) was particularly concerned about the uncontrolled manner in which wastewater reuse, particularly with untreated wastewater, was occurring in many areas. To address the challenges of sanitation, the GOM developed the National Sanitation Program (*Programme National d'Assainissement* [PNA]), which gave the National Potable Water Office (*Office National de l'Eau Potable* [ONEP]<sup>1</sup>) an expanded mandate for sanitation service provision, which had been the responsibility of municipalities.
2. Receiving limited subsidies from the GOM for operations, ONEP was able to adequately achieve cost recovery for operational expenses through tariffs and connection fees, as well as bulk water supply. In contrast, capital investments were largely subsidized. Further, the overall financial and operational efficiency of ONEP showed multiple areas that needed improvement.
3. At appraisal, the Bank was deemed well positioned to support the project as the Bank had a long-standing partnership with ONEP and the existing Country Partnership Strategy ([CPS] January 2010) included prioritization of the Water Sector (also supported through a Water Sector Development Project Loan [DPL], P095840) and expansion of sanitation service provision, as part of the third pillar on "Sustainable Development in Changing Climate." Furthermore, the Bank had the expertise to support ONEP in carrying out its relatively new mandate for sanitation service provision.

#### Theory of Change (Results Chain)

4. The project was designed around two components: 1) increasing access to sewerage services and improving treatment of collected wastewater aiming to provide public health and environmental benefits and 2) piloting non-conventional technologies for wastewater treatment, with an aim towards ensuring better performance and cost-effectiveness of technology selection. All activities were taking place within small towns in the Oum Er Rbia river basin. In parallel with the project, a number of additional GOM activities were ongoing to address long-term planning for the sector. The Bank had some involvement in these activities, including review of GOM's overall sector strategy.
5. *Activities:* For the first component, in the selected towns, the main activities included: expansion of sewerage networks, rehabilitation of portions of sewerage networks; new and rehabilitated household connections to the networks; construction of new wastewater treatment plants (WWTP); and rehabilitation of existing WWTPs. For the second component, the main activities were selection of technologies to test (based on international experience) and then implementation, including monitoring and evaluation of at least four pilots. To support the full range of activities, Technical Assistance (TA) and associated training/operational support were also provided to ONEP.
6. *Outputs:* The activities were expected to result in the following outputs: additional households connected to sewer networks; increased fraction of generated wastewater arriving at WWTPs; improved systems and capacity for

<sup>1</sup> ONEP was later merged in 2011 with the National Electricity Office (ONE) to become the National Electricity and Potable Water Office (*Office National de l'Electricité et de l'Eau Potable* [ONEE]).

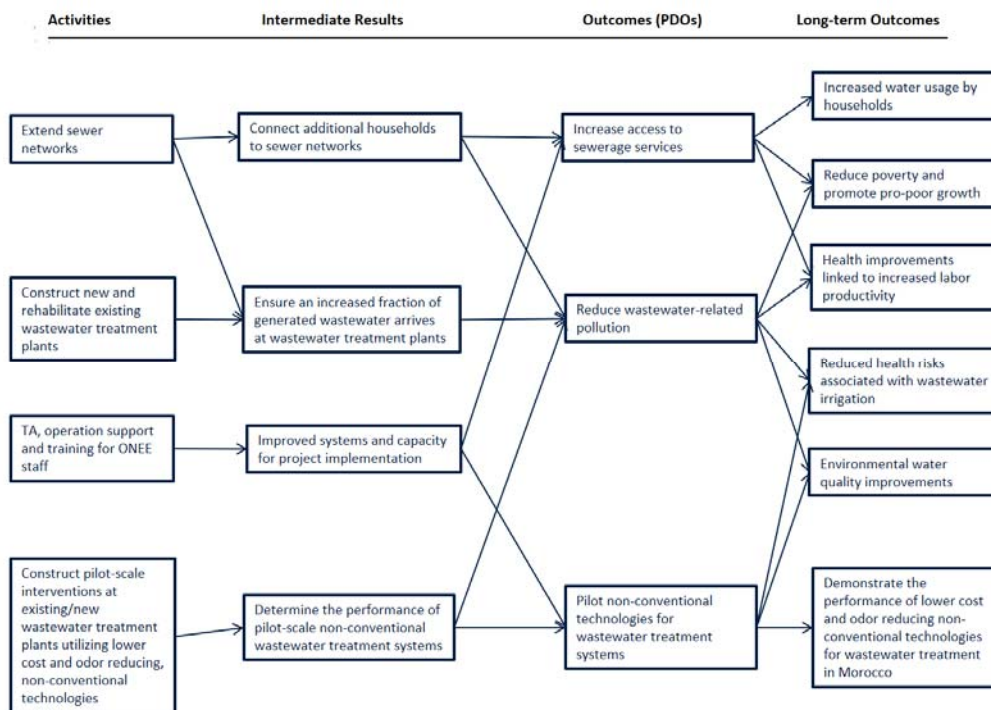


project implementation in the sanitation sector; and data on the performance of piloted wastewater treatment technologies.

7. *Outcomes:* In the project locations, the outputs were intended to increase access to sewerage services, reduce wastewater-related pollution and result in the piloting of non-conventional technologies for wastewater treatment systems.

8. *Long-term outcomes:* The project outcomes are expected to support the following long-term, government prioritized outcomes, (i) increased water usage by households (as sewer connections will reduce self-limiting of water usage); (ii) health improvements – both through the externalities associated with improved sanitation and the reduction in negative health risks associated with irrigation with untreated wastewater – that are further linked to increased labor productivity and poverty reduction; (iii) improvements in environmental water quality; and (iv) demonstration of lower cost options for treating wastewater, which will allow for existing budgets to provide service to a larger number of people.

Figure 1: Overview of Project’s Theory of Change at Appraisal



**Project Development Objectives (PDOs)**

9. The objectives of the Project, as stated in the Loan Agreement ([LA], loan number 7925-MA) are to: (i) increase access to sewerage services and reduce wastewater-related pollution in selected small and medium towns in the Project Provinces; and (ii) pilot non-conventional technologies for wastewater systems in selected locations.

10. The PDO stated in the LA and the Project Appraisal Document (PAD) are the same, except that the PAD lists the specific Provinces where the project intended to work, while the LA broadened the language to “Project Provinces,”



to ensure flexibility of the project.

### Key Expected Outcomes and Outcome Indicators

11. The PDO indicators at appraisal, with associated targets, were:

- Number of new sewerage connections provided under the project: 13,000 connections;
- Number of WWTPs complying with national standards (3 out of 4 samples in compliance every year): 10 WWTPs;
- Volume (mass) of Biochemical Oxygen Demand (BOD) pollution loads removed by treatment plants; financed under the project: 1,830 tons/year;
- Number of non-conventional systems piloted: 4 plants.

12. The following intermediate outcome indicators, with associated targets, were also tracked at appraisal but were eventually dropped:

- Number of Environmental Impact Assessment (EIA) studies approved by the relevant committees: 10 EIAs;
- Number of signed delegated management conventions: 10 contracts;
- Number of subprojects where consultation meetings with local stakeholders were carried out: 10 subprojects;
- Number of WWTPs constructed: 10 WWTPs;
- Number of ONEP's operation teams equipped with adequate operation and maintenance (O&M) equipment: 10 teams;
- Twinning contract signed and implemented as per schedule: pilots constructed and training completed;
- Odor control in existing treatment plants: 2 WWTPs.

### Components

13. The proposed project was designed with two main components: 1) wastewater collection and treatment and 2) piloting of wastewater technologies and implementation support.

14. **Component 1 - Wastewater Collection and Treatment** (US\$64.1 million original allocation, US\$66.8 million revised allocation, US\$63.7 million actual costs) included: rehabilitation and expansion of existing sewerage systems, including collection networks and treatment plants, and provision of equipment for the maintenance and operation of systems for about eleven selected small and medium towns in the Project Provinces (Afourer, Beni Ayat, Boujniba, Boulanouare, Chemaia, Demnate, El Brouj, El Ksiba, Hattane, Ouaouizeght, and Youssoufia), covering six provinces in the Oum Er Rbia river basin.

15. The towns were selected based on: population, current impact of raw wastewater discharges on human health and the environment, availability of feasibility studies, provision of potable water (by ONEP), and interest shown by the municipal authorities to delegate sanitation responsibility to ONEP. As originally envisioned under this component, an estimated 13,000 new households would be connected to the sewer networks, and wastewater from an estimated 240,400 people would be treated.

16. **Component 2 - Piloting of Wastewater Technologies and Implementation Support** (US\$5.7 million original allocation, US\$4.0 million revised allocation, US\$3.3 million actual costs) included three sub-components: 1)



strengthening the capacity of ONEP, through a twinning arrangement, to pilot low-cost, non-conventional (for Morocco) technologies for wastewater treatment in small towns; 2) piloting of odor-control and methane-capture technology at two selected treatment plants; and 3) providing implementation support, for construction supervision, project management, monitoring and reporting, monitoring of environmental management plans, community awareness-raising campaigns, promotion of wastewater reuse projects, and development of an operational strategic plan for sanitation activities.

17. The first sub-component (US\$0.4 million original allocation) was designed to finance the services to be provided by the twinning partner. This partner, a utility selected for this South-South exchange, would need to have expertise in low-cost and non-conventional wastewater treatment technologies, and further have expertise in sharing some experiences with another utility (i.e., ONEP). ONEP would then be responsible for further disseminating this knowledge into the local consulting industry through workshops and conferences.

18. The second sub-component (US\$1.8 million original allocation) was meant to finance the covering of anaerobic ponds in two pilot cities, which would allow for odor reduction and methane capture. The State Secretary of Water and Environment (*Secrétariat d'Etat pour l'Eau et l'Environnement* [SEEE]) had previously overseen a study that identified the floating geomembrane cover as the best option, based on technical and economic considerations.

19. The third sub-component (US\$3.5 million original allocation) financed consulting services for construction supervision, project management, and monitoring and reporting (including for safeguards related topics). The sub-component also financed inputs for: a) ONEP's communications campaign, for raising awareness and engaging with project beneficiaries; b) catalyzing the development of reuse projects; and c) the preparation of an operational strategic plan for sanitation activities.

## B. SIGNIFICANT CHANGES DURING IMPLEMENTATION

### Revised PDOs and Outcome Targets

20. In June 2014, a Level I restructuring was completed to remove the second objective from the PDO (in an effort to focus more on prioritized component 1 activities), among other changes. In line with the Millennium Development Goals (MDGs), the language in the PDO was also broadened from "sewerage" to "sanitation."<sup>2</sup> The revised PDO is "to increase access to sanitation services and reduce wastewater-related pollution in selected small and medium towns in Project Provinces." In essence, the first objective of the original PDO remained unchanged.

### Revised PDO Indicators

21. As part of the same June 2014 restructuring, and the associated change to the PDO, the results framework (RF) was updated. The changes to the RF also included revisions to align with Bank core sector indicators (and the language of the MDGs) and updated targets based on more realistic estimates. Table 1 summarizes the PDO and associated indicators from appraisal and after restructurings, and Annex 8 shows the original PDO indicators as well as the indicators after the June 2014 restructuring and after the May 2017 restructuring.

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<sup>2</sup> Though the term "sanitation" is broader than "sewerage," the project activities are in line with this language and the language of the MDGs, and are also aligned with the more recent Sustainable Development Goals, as they consider the full sanitation service chain: from household access to conveyance, treatment and end use/safe disposal.



**Table 1: Summary of PDO Indicators at Appraisal and after Restructurings**

Outcome	Original Indicator (target)	Revised Indicator (target) <sup>a</sup>
Increase access to sewerage services [revised to read: “increase access to sanitation services”]	Number new sewerage connections provided under the project (13,000 connections)	Direct project beneficiaries (220,000)
		Female beneficiaries (50 percent)
		Extremely poor beneficiaries (15 percent)
		Number of people in urban areas provided with access to improved sanitation under the project (130,000)
		Percentage of population in project area whose wastewater is collected (90 percent)
		Percentage of population in project area whose wastewater is appropriately treated (90 percent)
Reduce wastewater-related pollution	Number of WWTPs complying with national standards (3 out of 4 samples in compliance every year) (10)	WWTPs constructed under the project complying with national discharge standards <sup>3</sup> (6) <sup>b</sup>
	Volume (mass) of BOD pollution loads removed by treatment plants financed under the project (1,830 tons/year)	Volume (mass) of BOD pollution load removed by treatment plant under the project (800 tons/year) <sup>c</sup>
Pilot non-conventional technologies for wastewater treatment systems	Number of non-conventional systems piloted (4)	<i>dropped</i>

<sup>a</sup> The initial revisions to the RF took place as part of the June 2014 restructuring. In May 2017, as part of a Level II restructuring, additional changes were made to the RF, including two changes to intermediate results indicators and the addition of the PDO-level indicator “Percentage of population in Project area whose wastewater is appropriately treated.” This indicator was added to reflect the overall improvement in sanitation services under the project. Annex 8 shows the PDO indicators for all three phases of the RF.

<sup>b</sup> The number of plants was reduced from ten to six as the revised indicator only includes WWTPs that were constructed under the project, and not those that were already existing prior to the project.

<sup>c</sup> The target for this indicator was reduced following the restructuring though no clear rationale was presented for the dramatic reduction in the target.

### Revised Components

22. The first component was never formally revised, though the specific towns and the total number of towns that benefited under the project were revised. Instead of the planned 11 towns, a total of 14 towns benefited from the project. The specific project towns were also changed due to difficulties in acquiring land in Afourer, Beni Ayat, and Boujniba and due to local opposition in Demnate. As a result, the following cities were added, per agreement between ONEE and the World Bank: Azilal, Zaouiet Cheikh, Aghbala, Oued Zem, Khouribga, Berrechid, and Boujaad. (See Annex

<sup>3</sup> For WWTP certification, monthly sampling campaigns are done over the first year of operation, starting right after provisional acceptance of works, to measure BOD (limit=120 mg/L), COD (limit=250 mg/L) and TSS (limit=150 mg/L). If after one year, the WWTP is in compliance, sampling frequency is reduced to once every 3 months. See “Joint Ministerial Order of the Minister of the Interior, the Minister of Territorial Planning, Water and the Environment and the Minister of Industry, Trade and Economic Upgrading No. 1607-06 du 29 jourmada II 1427 (July 25, 2006) establishing the specific limit values for domestic WWTP effluents.





11 for a map of the project locations).

23. As part of the June 2014 restructuring, the piloting of low-cost and odor-reducing, non-conventional technologies was dropped from the PDO, but these activities were still pursued under the project. Consequently, overall, there were no significant changes to the activities under either component.

### Other Changes

24. In 2011, GOM approved a law (40-09) that restructured ONEP and merged it with electricity to create the National Electricity and Potable Water Office (*Office National de l'Electricité et de l'Eau Potable* [ONEE]). Consequently, in May 2013, a loan assumption agreement was signed between the International Bank for Reconstruction and Development (IBRD) and ONEE, as well as an Amended Guarantee Agreement with the Kingdom of Morocco to reflect the change of Borrower in the Guarantee Agreement.

25. As part of the June 2014 restructuring, the legal covenant related to the Borrower's Debt to Revenue ratio was revised. The original covenant required ONEP's (annually calculated) net revenue be at least 1.2 times its estimated principal debt service requirements. Following the restructuring, the new legal covenant required that ONEE's cumulative debt to equity ratio be less than 4.5. This change was made to align with the then recently approved Rural Water Supply Project (P145529, loan number 8397-MA), which used the same covenant.

26. Due to works in the city of Boujaad including a portion of its Old Medina, which is a national heritage site, Operational Policy/Bank Policy (OP/BP) 4.11 related to Physical Cultural Resources was triggered, as part of the June 2014 restructuring. As with the other safeguards triggered under the project, country systems were used.

27. The project closing date was also extended twice to allow for additional time to complete project activities, particularly those in Chemaia, Youssoufia, Boulanouare and Hattane, which were activities closely aligned with the PDO. In September 2014, an 18-month extension was approved (in part due to the expansion to additional/new towns), which extended the closing date from December 31, 2015 to June 30, 2017. The closing date was again extended, by 11 months, in May 2017, to May 31, 2018.

28. As a summary, the following restructurings took place and focused on the noted changes:

- May 2013 (level II) – change of Borrower from ONEP to ONEE (following a restructuring of the sector in Morocco);
- June 2014 (level I) – removal of pilots from PDO; revision of RF; reallocation between disbursement categories (to reflect changes to PDO); triggering of OP 4.11 on Physical Cultural Resources; change of legal covenant on debt to equity ratio; change in disbursement estimates; changes in components and costs; and appraisal summary change in risk assessment;
- September 2014 (level II) – 18-month extension of closing date to June 30, 2017; and
- May 2017 (level II) – 11-month extension of closing date to May 31, 2018; revision of RF; reallocation between disbursement categories; change in disbursement estimates; and change in implementation schedule.

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

29. The main recommendation from the mid-term review (MTR) was to focus on core infrastructure activities in order to continue the existing implementation momentum and ensure achievement of the PDO. Consequently, the project was restructured to remove the piloting activities from the PDO. However, these activities were not dropped from





the project, and once the infrastructure activities were back on track, the pilots were again pursued, albeit with a focus on piloting without a twinning arrangement. The overall Theory of Change is not impacted as the scope of activities did not change.

## II. OUTCOME

### A. RELEVANCE OF PDOs

#### Assessment of Relevance of PDOs and Rating

30. Results Area 2 in the current Moroccan CPS (Report no. 86518-MA for FY14-FY17) focuses on “building a green and resilient future.” Under this results area, the first strategic outcome is to “strengthen management of soil, coastal and water resources,” including bank support for expanding access to improved sanitation, wastewater treatment and reuse. The project directly addresses this outcome. The second strategic outcome is to “increase renewable energy generation and enhance energy efficiency,” which this project supports through the use of solar power and energy-saving operating regimes for WWTPs (both under the pilots and for newly constructed WWTPs).

31. Under the CPS, Results Area 3 focuses on “strengthening governance and institutions for improved service delivery to all citizens.” The first outcome, “support more open and inclusive governance ensuring effective rights for citizens to access information and petition government,” includes reference to “enhancing access to water supply and sanitation services, including in rural areas,” as entry points. The project thus directly addresses this priority. The project further supports this Results Area’s strategic outcomes 3 and 4: “improve capacity to plan, manage and assess the delivery of key services, especially at the local level” and “expand access to basic services,” where basic services explicitly include sanitation for underserved areas.

32. The CPS also includes cross-cutting themes on gender and voice and participation. Though not explicitly included in the PDO, the project included specific activities to ensure voice and participation of citizens, including special focus for women in the beneficiary communities.

33. Further, as noted above, the project was developed to align with the GOM’s PNA and designed to finance PNA activities in the project locations. More specifically, under the PNA, the GOM aims to achieve 80 percent household sanitation coverage and treat 60 percent of wastewater by 2020, and this project expands both household sanitation coverage and portion of wastewater treated (through both new construction and rehabilitation of existing infrastructure). Further, the project’s focus on piloting of innovative technologies was in part meant to address the large funding gap that the sector was facing in order to implement the PNA. By exploring options for lower cost technologies, the aim was to allow the GOM to provide service to a larger number of households and treatment capacity for additional households. As the pilots were dropped from the PDO, this focus was diminished, but the piloting was still undertaken, and the project remained fully in line with the priorities in the PNA.

34. A new Country Partnership Framework (CPF) is currently under development and includes a strategic focus on Territorial Development, which includes, among other things, further increasing access to basic sanitation services as well as increased water resources planning with greater reliance on reuse of wastewater. The new CPF will also continue to place a strong focus on governance and citizen engagement. As such, the project’s relevance remains high for the government’s priorities.

35. The overall rating for the relevance of the PDO is High, given the PDO’s clear alignment with the Results Areas in the current CPS and overall alignment with the GOM’s PNA.



## B. ACHIEVEMENT OF PDOs (EFFICACY)

### Assessment of Achievement of Each Objective/Outcome

36. The original PDO can be unpacked to include the following three outcomes: increase access to sewerage services, reduce wastewater-related pollution, and pilot non-conventional technologies for wastewater treatment systems. Each of these areas will be separately considered. ONEE is responsible for sanitation service delivery management in all 14 towns, based on the municipalities having delegated this authority to ONEE (agreements signed between 2011 and 2014, depending on the town). This exceeds the originally targeted 10 delegated management contracts. Additionally, because of the PDO changes (Level 1 restructuring), the ICR is required to derive separate Efficacy ratings before and after restructuring. These split ratings are reflected below.

#### *Increase access to sanitation services*

37. Post-restructurings. Increased access to sanitation services was tracked based on five PDO indicators and four intermediate results indicators. In total, 144,004 people in urban areas were provided with access to improved sanitation, against a target of 130,000. This result means that, at present, wastewater from 96.3 percent of households is collected, against a targeted 90 percent (which exceeds the GOM national target of 80 percent collection). Additionally, of a targeted 220,000 beneficiaries, 231,964 people benefited from the project, of which 50.4 percent are female and 13.2 percent are extremely poor, compared to targets of 50 percent (101% achieved) and 15 percent (88 percent achieved).<sup>4</sup> The intermediate results indicators focused on number of new versus rehabilitated connections to the network. In total, 13,734 connections were rehabilitated and 10,239 were newly constructed for a total of 23,973 connections total, against targets of 13,000; 9,000; and 22,000 respectively<sup>5</sup>. The project also exceeded the targets for total length of sewer laid with 385.5 km laid (compared to the targeted 360 km).

38. The household surveys conducted in El Brouj and Aghbala<sup>6</sup> show that households that benefited from the project are much more satisfied than they were prior to the project – with 92 percent of households currently satisfied with their sanitation situation, compared with 3 percent who were satisfied before the project (and compared to 19 percent of non-beneficiary households in the same cities). Beneficiary households are also less likely to report problems with wastewater management, with 0 percent of households reporting problems at endline, compared to 17 percent prior to the project (and compared to 21 percent for non-beneficiary households). Although beneficiary households continue to have problems with greywater management, improvement is noted, with 33 percent reporting the existence of new or ongoing issues with greywater, down from 50 percent prior to the project (and compared to 29 percent for non-beneficiary households).

39. Though the survey did not track volumetric water usage per household, it did include some questions which suggest household water usage did increase for beneficiary households (in line with the proposed Theory of Change). For example, at baseline, the average adult was taking 0.8 showers per week (in beneficiary households, compared to 0.7 for non-beneficiary households), but at endline this had risen to 1.5 showers per week – i.e., roughly double. Additionally, beneficiary households increased the practice of at-home laundry, going from 60 to 78 percent of households handling laundry at home (compared to 41 percent of non-beneficiary households). Lastly, beneficiary

<sup>4</sup> Number of female and extremely poor beneficiaries are based on province-level and city-level data from 2014 (see Annex 10 for detailed data).

<sup>5</sup> These targets were revised as part of the Level II restructuring in May 2017.

<sup>6</sup> Surveys were only conducted in two locations as a cost saving measure. Within these two cities, households were selected randomly, with quotas to ensure all relevant quarters of the city were represented. In total 220 households (representing an estimated 1,078 people) were interviewed.



households increased handwashing practices, with 49 percent of surveyed individuals reporting handwashing at critical moments, compared to 42 percent at baseline (and compared to 36 percent of non-beneficiary households).

40. Pre-restructurings. Prior to restructuring, this outcome was worded as “access to sewerage services.” Originally, the number of new sewer connections was a PDO indicator, targeting 13,000 new connections. At the close of the project, this original target was 78.8 percent achieved. Though some of the original intermediate results indicators were dropped (2014 restructuring), the project held consultations in all 14 project locations (exceeding the targeted 10) and completed EIAs in all 14 locations as well (also exceeding the targeted 10).

41. Overall, the project successfully expanded service to a large number of households and exceeded the target for total beneficiaries based on revised targets. Based on the original targets, the majority of indicators were met or nearly met. Given substantial completion of the original target for improved access, and overachievement of the revised targets, the efficacy for this outcome is considered Substantial before restructuring and High after restructuring.

#### *Reduce wastewater-related pollution*

42. Post-restructurings: Reduced wastewater-related pollution was tracked based on three PDO indicators and three intermediate results indicators. Access to sewers greatly expanded under the project and 90 percent of generated wastewater is treated (matching the target of 90 percent), exceeding the GOM national target of 60 percent treatment. On average, the newly constructed plants are removing 74.2 percent of influent BOD, which is just below the targeted 75 percent removal (98.9 percent achievement). An estimated 1,353 tons of BOD pollution is removed by these plants each year,<sup>7</sup> which exceeds the targeted 800 tons per year (169 percent achieved).

43. The project constructed six treatment plants (see Annex 9 for further details). At present, compliance can be verified with only one of the six (16.7 percent) treatment plants built under the project since the national standards require plants to be in operation and evaluate effluent organic and suspended solids concentrations for at least 12 months before compliance can be assessed. The other newly constructed plants have therefore not been in operation long enough to officially meet the compliance standard, but based on current performance, in the coming months, an additional three plants should officially be in compliance, that is, four total (66.7 percent of the target). Similarly, five of the plants associated with the project (including plants that already existed and those constructed under the project) are currently compliant (of 12 total plants under the project). With the additional three plants becoming officially compliant in the coming months, a total of eight plants will be in compliance (66.7 percent achieved). Additionally, it is likely that the positive results from the pilots will help ONEE improve the overall performance of the WWTPs that are currently not in compliance. The treatment plants constructed under the project resulted in an additional 115,891 population equivalents of treatment capacity (exceeding the targeted 115,000).

44. Beyond treating wastewater, the GOM also aims to better utilize treated wastewater for different reuse applications. To that end, in Boujaad and Oued Zem there are existing plans in place for creating small-scale treated wastewater irrigation schemes for use by local farmers, but the agreements are not yet in effect due to lack of funding. Additionally, in Khouribga, Youssoufia and Boulanouare, the OCP Group (formerly, the Office Chérifien des Phosphates [OCP]) operates the WWTPs and uses the treated wastewater for its mining operations.

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<sup>7</sup> This estimate is based on the number of new and rehabilitated connections made that go to a treatment plant, assuming an average treatment efficiency of 71.6 percent (based on a study done in 2017), an average per capita production of 30 g of BOD per day (reaching the sewer network), and based on a city-level estimates of number of people per connection (based on the 2014 census). Annex 9 includes a summary of the wastewater treatment plants impacted, including their current compliance status and BOD removal rates.



45. Pre-restructurings. As with the first outcome, the second outcome did not change as part of the restructuring. However, the outcome indicators and targets for this outcome were changed. As originally designed, the project aimed to build ten treatment plants, remove 1,830 tons of BOD each year, and to have 10 project-related WWTPs in compliance with national standards. The project achieved, or is expected to achieve, 60 percent (6 new treatment plants constructed), 73.9 percent (1,353 tons of BOD per year),<sup>8</sup> and 50 percent (up to 80 percent once the newly plants become officially compliant) of the original targets, respectively.

46. In light of modest achievement of the original targets, the pre-restructuring efficacy is considered Modest. Based on the revised targets, BOD loads to the environment have been significantly reduced (exceeding the post-restructuring target by over 40 percent) and the portion of wastewater treated achieved its target, but the number of compliant treatment plants (reasonably expected to be officially compliant in the near future) will be somewhat below its target (67 percent achievement, but with the potential for improved performance once the piloted technologies can be scaled). Consequently, based on the revised targets, the overall rating is Substantial.

#### *Pilot non-conventional technologies for wastewater treatment systems*

47. As originally envisioned, the project aimed to complete 4 pilots with non-conventional wastewater treatment technologies, including two pilots for technologies aimed at reducing odors. This was to be completed, in part, through a South-South twinning arrangement. Though the Bank organized a study tour to Brazil for a number of Moroccan sector professionals, a formal twinning arrangement did not materialize. However, ONEE decided to pursue the piloting as part of the project, nonetheless.

48. In El Ksiba and Azilal, anaerobic ponds were covered with hexagonal plastic pieces, which proved successful in reducing odors from these ponds, which met the original target of 2 pilots for reducing smells (100 percent achieved).<sup>9</sup> In El Brouj, Zaouiet Cheikh and Chemaia, floating baffles and mixing systems were piloted. The results on the effectiveness of the baffles were mixed (and thus inconclusive overall), and similarly the mixing system was shown to have limited effectiveness. In Boujaad, one channel of anaerobic ponds was converted to aerated ponds, which resulted in 66 percent reduction in BOD and 77 percent reduction in total suspended solids (TSS). In Ouaouizeght, a rock filter was tested for removal of algae and found to reduce TSS by 68 percent. Overall, the piloting was deemed successful given 1) pilots were conducted with appropriate monitoring of results and 2) ONEE now has an understanding of which options may be best to pursue moving forward.

49. Overall, this outcome was fully achieved and greatly exceeded as seven pilots (against a targeted 4) were completed and successfully tracked/monitored to allow for scaling up of effective solutions. Consequently, this outcome, relevant for the pre-restructuring rating only, is rated High.

#### **Justification of Overall Efficacy Rating**

50. Based on the original PDO, one of the three outcomes were rated High achievement, one was Substantial, and one was Modestly achieved, which leads to the objectives being almost fully achieved and an overall rating of Substantial. Based on the revised PDO, which only considers the first two outcomes (rated High and Substantial), the

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<sup>8</sup> The original target was calculated with a per capita BOD production of 50 gBOD per day (a standard figure for developed country cities), whereas analyses and discussions with ONEE later confirmed that a 30 gBOD per capita per day was more appropriate for Moroccan small towns. The revised targets were therefore more aligned with the reality on the ground, although considerably reducing the estimated affluent BOD loads to treatment plants which were part of the project.

<sup>9</sup> A household survey in Azilal found that 85 percent of surveyed respondents were satisfied with the results of the odor reduction pilot. This result stands in contrast to the 83 percent of households who originally raised concerns about the odors associated with the WWTP in their community.

overall rating is also Substantial.

**Table 2:** Summary of Overall Efficacy Ratings Before and After Level I Restructuring

Objectives/Outcome	Original PDO Achievement	Revised PDO Achievement
1 - Increase access to sewerage services	Substantial	High
2 - Reduce wastewater-related pollution	Modest	Substantial
3 - Pilot non-conventional technologies for wastewater treatment systems	High	N/A
<b>Efficacy</b>	<b>Substantial</b>	<b>Substantial</b>

### C. EFFICIENCY

#### Assessment of Efficiency and Rating

51. Overall, costs for the project ended up being in line with the original estimates, and expected outputs were delivered. Anticipated benefit streams to producer and consumer surplus (linked to the sewerage tariff and increased property values, respectively) have not materialized as originally calculated. Residential property prices in the project area have only marginally increased in nominal terms (and actually decreased in real terms) over the lifespan of the project. However, a wide range of benefits identified, but not quantified at appraisal, have now been incorporated (See Annex 4 for the detailed description of the economic and financial analyses). These include the direct costs of emptying septic tanks, wastewater reuse in agriculture, reduction in environmental pollution, and health benefits.

52. Based on household septic tank emptying costs, households are now benefiting from lower costs for services, totaling an estimated 2000 MAD (~US\$200) per year per household. Additionally, benefits linked to wastewater reuse for agriculture and reduced environmental pollution (including removal of BOD, nitrogen and phosphorus) were assessed at the ICR stage and estimated to total US\$1.5 to 2.2 million per year and US\$2.4 million per year, respectively. Though no health data were collected at project sites, based on published literature, an annual benefit of US\$10 per person living in the project area was estimated, based on reductions in sanitation-related diseases (namely diarrheal diseases), totaling over US\$2.1 million per year. This combined benefit stream over a 40-year project period, at a discount rate of six percent,<sup>10</sup> results in an economic net present value (NPV) of US\$33.6 million, or an economic rate of return (ERR) of 9.4 percent.

53. In terms of the financial analysis, ONEE's operating cost coverage ratio, for its combined water and sewerage operations, is well above the regional average. Before depreciation, interest and tax charges, ONEE's combined water and sewerage operations generate a positive cash flow, reporting an operating cost coverage ratio of just under 2 over the 2010 to 2015 period. Under the existing tariff structure, the system is designed with sanitation envisioned to be cross-subsidized by the other sectors under ONEE's mandate. In 2016, the cross-subsidy to sewerage services resulted in ONEE reporting a deficit of 129 million MAD (US\$13 million). Without increasing sewerage tariffs, the burden of cross-subsidizing sewerage will grow as the coverage of sewerage services is expanded across areas of Morocco. Debt relating to water and sanitation investments has doubled in 8 years and the debt service has become unsustainable. Annex 4 includes additional information and analyses related to ONEE's financial performance and the impacts of proposed subsidy reforms.

<sup>10</sup> At appraisal, a discount rate of ten percent was used, but at present, the World Bank's Sustainable Development Chief Economist recommends a discount rate of six percent.

54. A summary of the economic and financial analysis results at Appraisal and at the ICR stage are shown in Table 3. Given that the economic analysis meets expectations in the sector, but ONEE’s financing is faring more poorly than at the time of appraisal, the overall efficiency rating is Modest.

**Table 3:** Summary of Economic and Financial Analysis at Appraisal and ICR

	<b>Economic Rate of Return</b>	<b>Economic NPV (US\$)</b>	<b>Financial Rate of Return</b>	<b>Financial NPV (US\$)</b>
At appraisal	11 percent	4 million	5.7 percent	-9 million
At ICR	9.4 percent	33.6 million	n/a	-82 million

#### **D. JUSTIFICATION OF OVERALL OUTCOME RATING**

55. The overall rating of the relevance of the PDO is High. Based on both the original and revised PDO (and the associated outcomes and targets), the project efficacy is rated Substantial, as, overall, the three outcomes were substantially achieved, or can reasonably be expected to be achieved in the near future. The Efficiency of the project suffered due to the high cost of sewerage sanitation services relative to the measurable benefits and lack of tariff increases, and consequently was rated Modest. Table 4 summarizes the overall outcome ratings for the project, based on the required methodology for projects requiring split ratings. Based on this approach, the project’s Overall Outcome rating is Moderately Satisfactory.

**Table 4:** Summary of Overall Outcome Ratings Before and After Level I Restructuring

	<b>ICR Ratings</b>	
	<b>Original PDO</b>	<b>Revised PDO</b>
Relevance	High	
Efficacy	Substantial	Substantial
Efficiency	Modest	
Outcome	Moderately Satisfactory	Moderately Satisfactory
Outcome Value on 6-point scale	3	3
Disbursement weight	7.4%	92.6%
Weighed Outcome Value	0.22	2.78
Weighed Overall Outcome Value <sup>a</sup>	3.0	
Weighed Overall Outcome rating	Moderately Satisfactory	

<sup>a</sup> Sum of weighted Outcome values for Original and Revised PDO (based on disbursements as of the time of ICR writing).

#### **E. OTHER OUTCOMES AND IMPACTS**

##### **Gender**

56. The project included a number of activities aimed at increasing (i) citizen engagement with ONEE and (ii) ONEE responsiveness to citizens. These activities included awareness raising and mobilization campaigns, as well as activities aimed at women’s needs in particular, as women are major users of household sanitation services. For example, women represented 80 percent of the people contacted through door-to-door awareness raising about the project





(32,000 of 40,000 people contacted). However, women were less well represented in consultations about getting new households connections, as women were less likely to be heads of households (on average 18 percent of households were female-headed). Additionally, under the project, 116,910 women gained access to new or improved sanitation services at home.

### **Institutional Strengthening**

57. The project was the first project in Morocco to pilot the Use of Country Systems (UCS) for environmental and social safeguards. The UCS allowed for the strengthening of these systems and for greater government ownership and capacity building around the use of these systems.

58. In addition, the Bank team mobilized, in 2016, parallel funding in the form of “just-in-time technical expertise” (for a total of US\$35,000) to support the development of ONEE’s capacity to design, operate, and maintain new innovative wastewater treatment technologies for the Moroccan context. This support focused on two technologies that ONEE had interest in piloting and expanding in the context of their PNA, namely anaerobic reactors (such as the Upflow Anaerobic Sludge Blanket [UASB] reactors) and aerated lagoons. Design manuals for each of these technologies were developed and were used by ONEE to design the Hattane WWTP using aerated lagoons (financed by the project) , as well as its first UASB plant in Chwitter (under construction; not financed by the project).

### **Mobilizing Private Sector Financing**

59. As noted, in Youssoufia and Boulanouare, the OCP Group operates the WWTPs and uses the treated wastewater for its mining operations. The OCP Group is responsible for funding both the capital and the O&M costs for these sites, and ONEE handles investments (co-financed with the participating towns), as well as the O&M of the sewer networks and pumping stations, and uses the money collected through household tariffs to cover these costs. This arrangement ultimately results in the private sector (i.e., the OCP Group) funding part of the operational expenditure, in exchange for unlimited use of the treated wastewater.

### **Poverty Reduction and Shared Prosperity**

60. The project provided sanitation services to 30,584 extremely poor people<sup>11</sup>. Further, by supporting treatment of wastewater, the project indirectly provides benefits to public health and the environment – both of which are public goods with further benefits for all.

### **Other Unintended Outcomes and Impacts**

61. Due to early challenges with acquiring land, in part driven by the piloting of the UCS for safeguards and in part due to some local opposition, the project ended up developing a detailed process of citizen engagement, focusing on the land acquisition process and project information sharing. The project developed and utilized a range of tools for engaging with communities, including: appointment of an ONEE “Land Acquisition Focal Point;” establishing Local Monitoring Committees; holding consultations and public information campaigns; and utilizing a strong Grievance Redress Mechanism (GRM) that allows for multiple channels of grievance collection, including oral methods (in line with local practice). This approach was found to be so successful that ONEE is now using it for all sanitation projects, and it was documented as one of the best regional practices by the Water GP’s citizen engagement team. Annex 7 contains further details on the citizen engagement approach, including the Local Monitoring Committees and GRM.

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<sup>11</sup> 13.2 percent of 231,964 beneficiaries.



### III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

#### A. KEY FACTORS DURING PREPARATION

62. The project was designed to address a GOM priority and was based on international best practice for technical interventions of this nature. The project was prepared with a simple design, including clearly structured components with well-planned implementation approaches. The RF was also designed to capture the key activities as well as relevant outcomes for each part of the PDO. The indicators chosen were appropriate and realistic, as well as easily measurable.

63. The project was delayed once implementation began, however, some of the delays would have been difficult to predict, given this was the first time country systems were being used under a Bank-financed project in Morocco. However, given the significant challenges in securing land, and the public objections and demonstrations in multiple locations, it is notable that the PAD does not reference any possible risk of delays due to land acquisition (though it was flagged in the appraisal Safeguards Diagnostic, approved around the time the PAD was written). This gap suggests lack of full recognition of the importance of local communities as key stakeholders in the process.

64. Additionally, delays in the first years of implementation were partly linked to the need to undertake a number of studies and completion of standard bidding documents, which should have been completed during preparation.

#### B. KEY FACTORS DURING IMPLEMENTATION

65. The project strongly benefited from clear leadership and commitment by ONEE's project management team, and its close coordination with the ONEE offices and local communities in each project area. The project implementation support TA helped the different parts of the project management team (e.g., fiduciary, safeguards, technical) in this coordination and communication role. The project team was well equipped and staffed with high capacity individuals. Consequently, the team was able to be highly responsive to the implementation challenges that arose. Through close monitoring and regular engagement with key stakeholders – especially local communities – implementation challenges were documented and addressed in a timely manner, especially following the MTR.

66. The MTR was effectively used to scale back and prioritize key activities for the remaining years of the project. The removal of the pilots from the PDO, and the originally envisioned twinning arrangement, actually allowed ONEE to revisit the approach to piloting. And ultimately ONEE decided to pursue piloting without the need for a twinning arrangement – which has proven to be quite effective. Additionally, following the MTR, the project continued to utilize the RF and related Monitoring and Evaluation (M&E) activities to ensure the project activities linked to the PDO were completed in line with all fiduciary, safeguards and technical standards.

67. One of the most significant positive factors during implementation was the dedicated efforts of the Bank's social safeguards consultant and ONEE's social safeguards team members. The focus on citizen engagement and ensuring proper land acquisition protocols were followed allowed construction for the project to move forward. Without the efforts of these individuals, and ONEE's willingness to rethink its approach to land acquisition, the project would likely have been unable to achieve the PDO.

68. The first years of the project's implementation saw significant challenges linked to delays in disbursement and difficulties in securing land. The disbursement delays were due to delays in procuring the project implementation support TA and incomplete design studies, which should have been completed during preparation. As a result, the first disbursement did not happen until nearly two years after effectiveness. The procurement delays were noted over the first years of implementation in the project Implementation Status and Results reports (ISRs), and the delays were





also linked to internal changes within ONEE (then ONEP) regarding which unit would be responsible for implementation.

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

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

###### M&E Design

69. Overall, the M&E system was well designed and included indicators for tracking key activities, outcomes, and objectives in line with the Theory of Change. However, the project included a number of activities (some of which were not directly linked to the PDO), which, consequently, were not tracked in the RF. The original RF did not include intermediate results indicators for the full range of planned activities, but following restructuring, the RF incorporated these intermediate indicators. The indicators were well selected and were specific, measurable and achievable. The indicator on WWTP compliance struggled due to the long time lag in getting nationally approved compliance (following 12 months of performance) and lack of data on the WWTPs operated by the OCP Group.

70. The M&E for the project RF was handled largely by the implementation support TA firm and the Bank team. However, ONEE's team relied on the TA firm and the associated RF data for project implementation, in addition to other M&E carried out by ONEE specifically for the pilots.

###### M&E Implementation

71. Though there were initially some challenges in the first years of the project, the MTR was a turning point that allowed for refocusing activities for the remaining years of the project. The RF was consistently and regularly updated, using rigorous methods and triangulation, where possible, and these updates were reflected in the ISRs. Further, ONEE did considerable data collection beyond the scope of the RF – including a baseline and endline household survey in Aghbala and El Brouj, careful monitoring of the land acquisition processes, as well as careful M&E of the wastewater treatment technology pilots.

72. The RF was regularly updated during the project to reflect the changes in the project focus/scope as well as experiences using the RF in practice. For instance, intermediate results indicators were added to track construction progress of the sewer networks and new versus rehabilitated household connections.

73. Apart from one ISR (ISR4), which noted poor quality M&E (specifically flagging the poor quality of the progress report by ONEE,<sup>12</sup> then ONEP), the overall M&E quality was high throughout the project. Further, although the project specific indicators were largely being tracked by the TA firm, much of the data for the RF and larger M&E were drawn from regular ONEE data collection.

###### M&E Utilization

74. The project RF was effectively used, particularly following the MTR. Project ratings were updated to reflect the results in the RF. For example, early in the project the Implementation Progress (IP) rating was kept at Moderately Unsatisfactory to reflect the lack of progress on household connections, which were being tracked separately from kilometers of network laid. The ability to separately track length of network and number of household connections is particularly important given international experience with low household connection rates in many other countries.

<sup>12</sup> Upon noting this issue in the ICR, it was quickly resolved, and the following ISR rated M&E Moderately Satisfactory.



75. The M&E for the piloting of wastewater treatment technologies continues to be utilized by ONEE to justify which interventions should be scaled up or used elsewhere.

#### **Justification of Overall Rating of Quality of M&E**

76. There were minor shortcomings in the initial M&E design, but the RF was regularly updated and revised during implementation to reflect realities on the ground and the changing needs of the project. Additionally, the M&E was regularly reported on and the results were used to inform how to prioritize actions, in line with the PDO. The project also used M&E for the piloting of treatment technologies, which allowed for a robust review of the effectiveness of these technologies. This testing went well beyond the scope of the originally envisioned RF and has been fully owned by ONEE. Similarly, the land acquisition was carefully monitored, which helped limit project delays. Consequently, the overall rating of the quality of M&E is Substantial.

## **B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE**

### *Environmental and Social Safeguards*

77. This project was the first in Morocco to pilot the UCS for environmental and social safeguards. The project was Category B and triggered the following safeguards: OP/BP 4.01 Environmental Assessment, OP/BP 4.11 Physical Cultural Resources, and OP/BP 4.12 Involuntary Resettlement. The project complied with all applicable environmental and social safeguards. However, early in the project there were delays, in part due to low capacity and limited experience with the UCS under a Bank project, i.e., country systems complemented with the improvements recommended following the environmental and social system assessments.

78. EIAs were carried out by ONEE, and deemed acceptable based on national legislation, for all fourteen towns. Some ISRs noted minor concerns with the quality of reporting on Environmental and Social Management Plans (ESMPs), though they also note clear compliance with relevant workers health and safety, signage, waste management, etc. Groundwater quality data are also collected surrounding WWTP locations where there are concerns about the groundwater table (namely in Hattane, Aghbala, El Ksiba, Brouj, and Ouaouizeght). At these sites, beginning in 2015, upstream and downstream groundwater wells were installed and samples are analyzed bi-annually. To date, monitoring in Aghbala and Ouaouizeght have shown that groundwater quality is stable, while the Hattane station is not yet operational, and the piezometers in El Ksiba and El Brouj are dry. In Boulanouare, prior to the project, raw waste was flowing into the environment. The project helped to resolve this situation by building the collection network and a pumping station, which deliver the wastewater to a treatment plant operated by the OCP Group. The network and pumping station are currently completed and operational, as of October 2018.

79. Under OP/BP 4.11, in Boujaad, a small part of the works took place in the Old Medina, which is a national heritage site. GOM environmental legislation concerning the cultural heritage is Law 22-80 (1-80-341) of 1980 amended and supplemented in June 2006 and Law 19-05 (1-06-010215) on conservation of historic monuments/sites, art and antiquities. As no chance finds were found, the protocols under these laws were not undertaken.

80. In line with the Diagnostic Safeguards Review, prepared in March 2010 for using the National Environmental Protection System and the National Land Acquisition Procedure for the project under OP/BP 4.00 "Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects," all the gap filling and sustainability measures were implemented by the ONEE team who developed, implemented and ensured a close follow-up of an action plan to assist beneficiary municipalities with land acquisition processes for each sub-project. Land acquisition protocols were developed under the project and are now being used for all sanitation projects of ONEE and are being considered for use in all water supply projects (training of water personnel has already occurred). Under these protocols, land acquisition for WWTPs, pumping stations and other small works are carried



out by the communes<sup>13</sup> with oversight from ONEE to ensure conformity with the overarching protocols. The land was acquired through willing-buyer/willing-seller arrangements and in some cases through donations (i.e., no expropriation). Among a total of 134 owners, 117 were compensated and 17 (who have problems of succession further to the death of the owner), were contacted on several occasions, informed of the availability of their compensation, which they will receive once their problems of succession are resolved. Under the project, all land acquisition was deemed compliant. An external and independent review of land acquisition, in July 2015, found that: (a) the project does not generate physical displacement, as there are no homes on the land to be acquired; (b) economic impacts of the project remain limited, as (i) land is either bare or used for cereal farming with very few fruit trees, which are compensated for, (ii) plots to be acquired are mostly small<sup>14</sup>; (c) all persons affected by the project are owners; and (d) acquisitions are voluntary and have, in many cases, been the subject of negotiations regarding their principle (owners having the choice) and the sale price of the property, which is a fundamental difference with involuntary acquisitions and even more so with involuntary acquisitions involving physical or economic displacement.

81. Overall, the UCS was successful, though it required considerable capacity building early in implementation. Additional details on and a deeper analysis of the UCS can be found in Annex 7.

#### *Fiduciary*

82. The project generally complied with financial management (FM) requirements, though there were some delays in the first year of implementation due to use of Bank standard bidding documents. Some delays were also seen later in the project, which were part of the reason for the two extensions of the project closing date. Considerable progress was seen in the last two years of the projects, particularly in handling commitments and payments. Overall, as issues were raised in aide memoires (AMs) and ISRs, they were quickly addressed. For instance, though one ISR (ISR 4) noted an overdue audit, the issue was quickly resolved and moving forward deadlines were generally met for audits, though there were delays in submitting letters of internal controls after audits. ONEE complied with the annual requirement that its debt ratio remained below the limit of 4.5 (e.g., in 2016, the ratio was 3.01).

83. The audits recommended that ONEE improve its project accounting system, ensure better planning for annual budget (for better executing procurement in a timely manner) and explore having a separate system for donor financed projects. ONEE is currently exploring options for updating its accounting system to better support reporting for donors.

84. Overall, the activities complied with procurement requirements, though there were some procurement delays at different stages in the project. These delays were most often due to ONEE's internal processes for disbursements. Additionally, ONEE faced some challenges with contract management. In the first years of the project, procurement was extremely slow and was thus rated Moderately Unsatisfactory (ISRs 4-7). These challenges were overcome as the project progressed. For example, in ISR 7, it is noted that "strong senior management commitment" helped to "halve the time it takes from bid openings to contract signature." As a result, the project was consistently rated Moderately Satisfactory or Satisfactory for procurement from 2014 onward.

## **C. BANK PERFORMANCE**

<sup>13</sup> Morocco is sub-divided into 12 regions, 75 second-level administrative subdivisions, composed of 13 prefectures and 62 provinces, as well as into 1,503 communes. Each of these constitutes one of the levels of the decentralized territorial organization of the Kingdom of Morocco and is governed by public law, endowed with a legal personality, as well as with administrative and financial autonomy.

<sup>14</sup> 83 plots were less than 1 hectare in size and 58 of them were less than 500 m<sup>2</sup>.



### **Quality at Entry**

85. The Bank supported this project that was highly relevant and responsive to client demand. The project’s technical design was robust and aligned with the project’s objectives. The project also prioritized environmental protection and was well designed to ensure appropriate consideration of potential environmental impacts (both positive and negative). Additionally, the implementation arrangements, fiduciary arrangements, and M&E arrangements for the project were all well considered, overall. Within the scope of the project, activities were well designed, however, the Bank did not give larger consideration to supporting ONEE in creating a long-term strategy for funding/financing the sector. Further, the economic analysis done at appraisal was not a sound/robust analysis and should have utilized alternative methods, as further described in Annex 4.

86. Given the project piloted the UCS under a Bank project for the first time, additional time during preparation and during the early years of preparation would have helped the project progress more smoothly and in a timelier fashion. Land acquisition issues were not sufficiently appreciated during design and were not fully understood by the Bank team until a few years into implementation. In spite of these challenges, the UCS was appropriate given the high capacity client – and ultimately resulted in successful implementation, in line with Bank standards.

### **Quality of Supervision**

87. Through the majority of implementation, the Bank team and Bank management provided fair and honest ratings of project success, as seen through the downgraded ratings during the early project delays and the clear details provided in ISRs for how/when ratings would be updated for IP, safeguards, etc. The ISRs and AMs also included well written and thorough updates and reflections on the project’s progress.

88. The project was managed from the Bank side by a total of five task team leaders (TTLs), however, even though there was considerable changeover in the TTLs, the project overall did not suffer as a result but instead seemed to benefit from the infusion of new ideas at different stages of the project. Additionally, the handovers generally were well-handled and allowed for overall smooth transitions.

89. The Bank team also effectively utilized the MTR to reassess the project and, with the GOM, reprioritize activities to ensure a successful project.

90. Further, as noted above, the Bank’s social safeguards consultants provided critical on the ground support to the project, which helped ensure land acquisition in a timely manner, in line with Bank requirements and Moroccan law. This support ultimately ensured that construction activities, in line with the PDO, were able to occur under the project.

### **Justification of Overall Rating of Bank Performance**

91. Given the Bank’s overall performance at entry had some shortcomings but it provided strong support of the project during implementation, the Bank’s overall performance rating is Moderately Satisfactory.

## **D. RISK TO DEVELOPMENT OUTCOME**

92. ONEE has ongoing responsibility for O&M in each of the project municipalities and given its long history of working in sanitation, ONEE is well positioned to continue to operate and maintain the constructed networks and treatment systems. However, given its financial status, there may be challenges in long-term funding for the sector. Sanitation specifically is highly subsidized within ONEE, with subsidies provided from its electricity and water supply



activities, but, given sanitation’s considerable externalities (for public health and the environment), some form of subsidization is to be expected.

93. However, given the current performance of the new and rehabilitated treatment plants – as well as other treatment plants that ONEE operates – there is ongoing concern that the old WWTPs (those not built under the project) will continue to not comply with national standards. This risk is partially mitigated in light of the positive experiences with piloting of new technologies that could be introduced at old, non-compliant plants.

94. The piloting undertaken through the project is continuing to be scaled up to help improve performance of existing treatment plants. Additionally, ONEE continues to experiment with alternative treatment options – including its first UASB reactor, to which ONEE was first exposed during the study visit to Brazil, and for which the Bank team mobilized “just-in-time technical expertise.”

## V. LESSONS AND RECOMMENDATIONS

### *Lessons*

95. **The project benefited from a well-structured RF that tracked all stages of the Theory of Change – including activities, outputs and outcomes.** This tracking helped ensure that the full results chain was considered and the project objectives were met, particularly with respect to household connections. The well-designed RF, and its ongoing utilization, also helped the project adjust and refine focus as the implementation continued.

96. The use of appropriate monitoring was also reflected in the project’s use of pilots. **Piloting, with appropriate M&E, was found to be effective in testing the applicability of new technologies and to assess their utility in improving performance, as well as nuisance conditions (i.e., odors).** ONEE has demonstrated the capacity to select the technologies to test, design an appropriate testing framework and timeline (including M&E), and analyze the results to inform ongoing operations. As mentioned, ONEE is continuing this innovation through the construction of the first UASB for domestic wastewater treatment in Morocco. This result also points to the value of study visits and south-south knowledge exchanges, which served as part of the initial inspiration for ONEE’s undertaking of this work.

97. **In Morocco, the trial use of country systems, under OP/BP 4.00 “Piloting the Use of Borrower Systems to Address Environmental and Social Safeguards Issues in Bank-Supported Projects” for environmental and social safeguards proved successful.** During project preparation, gaps between World Bank requirements and the country systems were identified and gap mitigation measures agreed. The UCS, particularly when used for the first time in a country, or in a given sector, require additional time and support during preparation and implementation. This approach also requires sufficient counterpart buy-in and understanding of what ‘use of country systems’ really means, i.e., that the Bank will still evaluate these systems and may require some strengthening activities to ensure compliance with the Bank’s overarching safeguards principles.

98. **The use of a well-designed, adaptive approach to citizen engagement helped ensure that land acquisition, project activities, and service provision aligned with citizen’s concerns/interests and allowed the project to progress smoothly.** Without appropriate attention to the social dimensions of the project, particularly those related to land acquisition, the project would have faced significant delays in construction. By prioritizing this engagement, households were able to stay informed and ONEE was able to respond to citizens’ concerns in a timely manner. Through a mix of meetings, GRM systems, and connection programs that made sewer connections more affordable,



the project balanced the financial and technical constraints with the underlying desire to serve citizens and provide them with an improved service.

**99. In the end, the project would not have been successful without the coordinated efforts of ONEE’s teams, the TA firm, and the Bank’s team.** Within ONEE, a number of offices were involved in the project – given the implementation spanned 14 towns. Additionally, communes were involved, and ultimately handled, the land acquisition processes. As with most large infrastructure projects, there were also a number of teams within ONEE who needed to coordinate, including those working on technical aspects, environmental safeguards, social safeguards, fiduciary aspects, etc. Due to strong internal leadership, teamwork, and good communication, with all parts of the team, as well as support from the project TA firm, the project was ultimately able to substantially achieve its development objective by delivering increased access to sanitation services and a reduction in wastewater-related pollution.

#### *Recommendations*

100. The Oum er Rbia Sanitation Project provided clear evidence of ONEE’s commitment to provide adequate and adaptable sanitation solutions to small towns, i.e. the landscape between urban and rural. As ONEE moves towards increasing access to collection and treatment services in less populated towns and areas, it will be necessary to close the technical and institutional gaps to achieve this goal by defining the appropriate technically and financially sustainable solutions for sanitation in rural settings, as well as the corresponding institutional framework to deliver these sanitation services. Support to ONEE in that sense, given the lessons learned from this project, and best practice in providing universal access to sanitation, could focus on: (i) developing a menu of technical solutions, combining both onsite sanitation and sewerage solutions, with consideration of resource recovery and reuse, to ensure that human waste is safely managed along the whole sanitation service chain; (ii) expanding and adapting the citizen engagement approach used under the Project to rural areas to ensure that everybody benefits from adequate sanitation service delivery outcomes; and (iii) developing new and creative ways of funding sanitation.



**ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS**

**A. RESULTS INDICATORS**

**A.1 PDO Indicators**

**Objective/Outcome:** Increase access to sewerage services

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00 30-Jun-2010	0.00 30-Jun-2010	220000.00 31-May-2018	231964.00 31-May-2018
Female beneficiaries	Percentage	50.00 30-Jun-2010	0.00 30-Jun-2010	50.00 31-May-2018	50.40 31-May-2018
Extremely poor beneficiaries	Percentage	15.00 30-Jun-2010	0.00 30-Jun-2010	15.00 31-May-2018	13.20 31-May-2018

**Comments (achievements against targets):** 105% achieved for direct beneficiaries; 101% achieved for female beneficiaries; 88% achieved for extremely poor beneficiaries. Estimates of female and extremely poor beneficiaries are based on province-level and city-level estimates.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
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Number of people in urban areas provided with access to Improved Sanitation under the project	Number	0.00 30-Jun-2010	0.00 30-Jun-2010	130000.00 31-May-2018	144004.00 31-May-2018
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**Comments (achievements against targets):** 111% achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage of population in Project area whose wastewater is collected	Percentage	0.00 30-Jun-2010	0.00 30-Jun-2010	90.00 31-May-2018	96.30 31-May-2018
Percentage of population in Project area whose wastewater is appropriately treated	Percentage	50.00 30-Jun-2010	0.00	90.00	90.00 31-May-2018

**Comments (achievements against targets):** 107% achieved for portion of collected waste; 100% achieved for portion of wastewater appropriately treated. [Note: portion of wastewater that is appropriately treated is aligned with the second (not the first) PDO objective/outcome].

**Objective/Outcome:** Reduce wastewater-related pollution

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
WWTPs constructed under	Number	0.00	10.00	6.00	1.00





the Project complying with national standards		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018
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**Comments (achievements against targets):** 16.7% achieved based on revised target; 10% achieved based on original target.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Volume(mass) of BOD pollution load removed by treatment plant under the project	Tones/year	0.00	1830.00	800.00	1353.00
		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018

**Comments (achievements against targets):** 169% achieved based on revised target; 73.9% achieved based on original target.

## A.2 Intermediate Results Indicators

**Component:** Increase access to sewerage services

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Household sewer connections rehabilitated under the project	Number	0.00	0.00	13000.00	13734.00
		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018

**Comments (achievements against targets):** 106% achieved.



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
New household sewer connections constructed under the project	Number	0.00	13000.00	9000.00	10239.00
		30-Jun-2010	30-Jun-2014	31-May-2018	31-May-2018
Total number of household connections built under the Project (new or rehabilitated)	Number	0.00	0.00	22000.00	23973.00
		30-Jun-2010			31-May-2018
<p><b>Comments (achievements against targets):</b> 114% achieved for new connections (against revised target); 78.8% achieved for new connections (against original target); 109% achieved for total number of impacted connections.</p>					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Length of newly installed or rehabilitated sewerage network	Kilometers	0.00	0.00	360.00	385.50
		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018
<p><b>Comments (achievements against targets):</b> 107% achieved.</p>					

**Component:** Reduce wastewater-related pollution

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Additional treatment	Number	0.00	0.00	115000.00	115891.00



capacity of WWTPs constructed under the Project (in population equivalent)		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018
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**Comments (achievements against targets):** 101% achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
WWTPs associated with the project complying with national discharge standards	Number	0.00	0.00	12.00	5.00
		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018

**Comments (achievements against targets):** 41.7% achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average BOD abatement rate of WWTPs constructed under the Project	Percentage	0.00	0.00	75.00	74.20
		30-Jun-2010	30-Jun-2010	31-May-2018	31-May-2018

**Comments (achievements against targets):** 98.9% achieved.



**B. KEY OUTPUTS BY COMPONENT**

<b>Objective/Outcome 1: Increase access to sanitation services</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Direct project beneficiaries (231,964)</li> <li>2. Female beneficiaries (50.4 percent)</li> <li>3. Extremely poor beneficiaries (13.2 percent)</li> <li>4. Number of people in urban areas provided with access to improved sanitation (144,004)</li> <li>5. Percentage of population in Project area whose wastewater is collected (96.3 percent)</li> </ol>
Intermediate Results Indicators	<ol style="list-style-type: none"> <li>1. Household sewer connections rehabilitated under the project (13,734)</li> <li>2. New household sewer connections constructed under the project (10,239)</li> <li>3. Total number of household connections built under the Project (new or rehabilitated) (23,973)</li> <li>4. Length of newly installed or rehabilitated sewerage network (385.5 km)</li> </ol>
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> <li>1. New household sewer connections (13,734)</li> <li>2. Rehabilitated household sewer connections (10,239)</li> <li>3. Sewer network expansion and rehabilitation (385.5 km)</li> </ol>
<b>Objective/Outcome 2: Reduce wastewater-related pollution</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. WWTPs constructed under the project complying with national discharge standards (1 at time of ICR; reasonably expected to be 4 in the coming months)</li> <li>2. Volume(mass) of BOD pollution load removed by treatment plant under the project (1,353 tons/year)</li> </ol>



	<ol style="list-style-type: none"><li>3. Percentage of population in Project area whose wastewater is appropriately treated (90 percent)</li></ol>
Intermediate Results Indicators	<ol style="list-style-type: none"><li>1. Additional treatment capacity of WWTPs constructed under the Project (in population equivalent) (115,891)</li><li>2. WWTPs associated with the project complying with national discharge standards (5 at time of ICR; reasonably expected to be 8 in the coming months)</li><li>3. Average BOD abatement rate of WWTPs constructed under the Project (74.2 percent)</li></ol>
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	<ol style="list-style-type: none"><li>1. New WWTPs constructed under the project (6)</li><li>2. Pilots of new WWTP technologies to improve performance (7)</li></ol>

## ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

### A. TASK TEAM MEMBERS

Name	Role
<b>Preparation</b>	
Alexander Bakalian	Lead Water Resource Specialist (TTL at preparation)
Philippe Huc	Sr. Water and Sanitation Specialist
Augustin Pierre Maria	Economist
Jean-Charles de Daruvar	Senior Counsel
Hoi-Chan Nguyen	Consultant, Lawyer
Mohammed Bekhechi	Lead Counsel
Hocine Chalal	Regional Safeguards Adviser
Andrea Liverani	Social Development Specialist
Zakia B. Chummun	Language Program Assistant
Abdoulaye Keita	Procurement Specialist
Anas Abou El Mikias	Sr. Financial Management Specialist
Richard Verspyck	Consultant, Financial Analyst
Larbi Khrouf	Consultant, Reuse Specialist
Abdelmourhit Lahbabi	Consultant, Environmental Specialist
<b>Supervision/ICR</b>	
Jean-Martin Brault, Daniel Camos Daurella	Task Team Leader(s)
Moustapha Ould El Bechir, Abdoulaye Keita	Procurement Specialist(s)
Laila Moudden	Financial Management Specialist
Claudine Kader	Team Member
Markus Friedrich Vorpahl	Social Safeguards Specialist
Taoufiq Bennouna	Environmental Safeguards Specialist
Khalid Anouar	Environmental Safeguards Specialist



Mohamed Adnene Bezzaouia	Environmental Safeguards Specialist
Rebecca Jean Gilsdorf	Team Member
Houcine Gabi	Social Safeguards Specialist

**B. STAFF TIME AND COST**

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
<b>Preparation</b>		
FY07	.600	930.72
FY08	4.982	46,242.37
FY09	15.790	125,972.41
FY10	44.823	393,408.78
FY11	0	2,231.84
<b>Total</b>	<b>66.20</b>	<b>568,786.12</b>
<b>Supervision/ICR</b>		
FY11	16.804	98,528.20
FY12	5.870	34,133.34
FY13	13.619	70,114.08
FY14	15.815	181,164.77
FY15	9.800	81,370.54
FY16	21.475	186,668.85
FY17	17.448	147,209.47
FY18	7.570	102,907.53
FY19	11.468	68,628.79
<b>Total</b>	<b>119.87</b>	<b>970,725.57</b>



**ANNEX 3. PROJECT COST BY COMPONENT<sup>15</sup>**

Components	Amount at Approval (US\$M)	Actual at Project Closing (US\$M)	Percentage of Approval (%)
Part I: Wastewater collection and treatment	64.1	63.7	99.4
Part II: Piloting of Wastewater Technologies and Implementation support	5.7	3.3	58.5
Unallocated (contingencies)	5.3	0	0
<b>Total</b>	<b>75.1</b>	<b>67.05</b>	<b>96.1</b>

<sup>15</sup> The figures in this table do not match those shown in the ICR Data Sheet (page 2) because at the time of ICR writing, there were still funds in the ONEE Designated Account that had not yet been used for a specific component. Some of these funds may eventually be returned to the World Bank, if the items are not cleared before the end of the grace period, i.e. November 30, 2018. In addition, because of the currency dynamics between the Moroccan Dirham and the USD throughout the project implementation period, the total cost ended up being lower than the original estimated amount of 75.1 USD equivalent. Between effectiveness and the time when works started being initiated, the Moroccan Dirham had depreciated by more than 15 percent against the USD and maintained this gap until project closing.





ANNEX 4. EFFICIENCY ANALYSIS

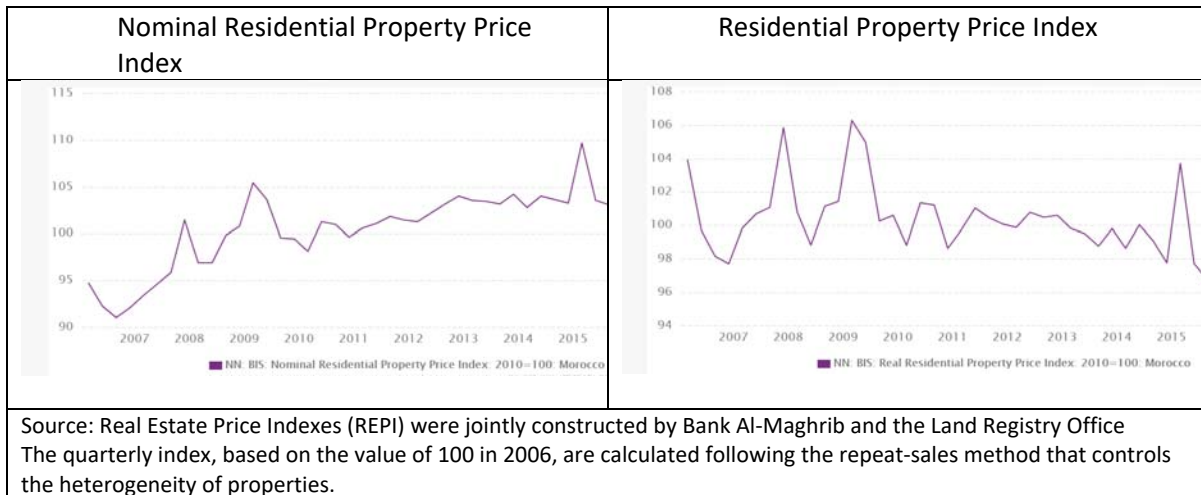
Exchange rate 1 US\$ = 9.8 MAD in 2016<sup>16</sup>

Economic Analysis

1. **Costs for the project were in line with estimates.** The Oum Er Rbia Sanitation project financed sewage treatment plants in 13 towns in Morocco with a combined population of 240,000. The total cost of the project was estimated at just under US\$70 million (including both hard and soft components), US\$ 43 million of which was financed by the International Bank for Reconstruction and Development (IBRD). All the expected outputs were met by the project within the estimated costs.

2. **But, anticipated benefit streams to producer and consumer surplus have not materialized as originally calculated.** At project appraisal, the Economic Rate of Return (ERR) was estimated at 11% with the investment having a net present value (NPV) of around US\$4 million. This return was premised principally on two benefit streams: (i) a producer surplus through the sewerage tariff, and (ii) a consumer surplus through estimation of the increase in property value derived from connecting to sewerage services. Neither of these benefit streams have materialized to date as (i) sewerage revenues do not cover the costs of providing sewerage costs, hence there is no producer surplus (see financial analysis), and (ii) there has been only a modest increase in residential property prices in nominal terms and a decrease in real terms (Figure A4.1).

Figure A4.1: Real Estate Price Index for Morocco



3. **From the above real estate data, there is also no indication that property prices have increased more in towns with better access to sewerage than those with poorer access to sewerage.** Though no ex-post data on the relative prices of residential property with versus without access to sewerage are available, an ex-post household survey in two cities, El Brouj and Aghbala, reported that 92 percent of households were satisfied with their sanitation situation, compared with 3 percent who were satisfied before the project (and compared to 19 percent of non-beneficiary households in the

<sup>16</sup> <https://data.worldbank.org/indicator/PA.NUS.FCRF?locations=MA>



same cities). This suggests a benefit but unfortunately this was not quantified.

4. **Other economic benefits including the direct costs of emptying septic tanks, health benefits, and the environmental benefits of reducing pollution, were not estimated at appraisal.** The average cost of emptying septic tanks for a 5-person household, reported by ONEE, were between 1750 and 3500 MAD per year, compared to the estimated 619 MAD sewerage charge for a 5-person household per year. This suggests two possible benefit streams: (i) to households, and (ii) to the environment. Taking the mid-point of the emptying costs, the benefit to the household would be around 2,000 MAD (~US\$200) a year, and the benefit to environment would be the wastewater seepage avoided. This benefit would be based on the difference between the volume of septage emptied by households (10m<sup>3</sup> a year assuming one vacuum truck visit a year) and the amount of wastewater disposed by the household, which could be as much as 80m<sup>3</sup> a year (see point below on environmental costs). The benefit stream related to household savings is based on the number of new connections (10,239) and is estimated at just over US\$2 million a year.

5. **Water reuse for agriculture and reductions of environmental pollution also generated benefit streams, albeit modest.** The costs of no action can be categorized into three groups: adverse human health effects associated with reduced quality of drinking and bathing/recreational water; negative environmental effects due to the degradation of water bodies and ecosystems where untreated or inadequately treated wastewater is discharged; and potential effects on those economic activities that use polluted water for crop production, fisheries, aquaculture, or tourism. The majority of these are very difficult to value but estimates are made here of wastewater for agricultural reuse and reduction in BOD per year.

6. **Though there is no tariff for treated wastewater, agricultural irrigation water from other sources costs between 1.5 to 3 MAD/m<sup>3</sup> for gravity irrigation and 4 to 8 MAD/m<sup>3</sup> in other irrigation schemes.** Based on a conservative estimate (1 MAD per m<sup>3</sup>) for the value of treated wastewater used for agriculture, the benefit stream over the 40-year project period would be between US\$1.5 to US\$2.2 million (depending on 60-90 liter per capita water use per day at a six percent discount rate).<sup>17</sup>

7. **The reductions in BOD were around 1,300 tons/year.** Though there are no studies on the value of these reductions in Morocco, studies in Spain estimate the cost of inaction as being equivalent to US\$70 per ton per year. This would generate a further benefit stream of just under US\$ 100,000 a year when pro-rated for Moroccan GDP per capita on a Purchasing Power Parity (PPP) basis. Discharges of nitrogen and phosphorus into the environment, which can contribute to increasing treatment costs at downstream water treatment plants, as well as to eutrophication, both monitored by the Oum Er Rbia River Basin management institution ("*Agence du Bassin Hydraulique de l'Oum Er Rbia*"), were attributed regret costs of just over US\$1 million along a further US\$1.2 million a year for other common sewage-related pollutants. Together these related environmental costs of non-action were estimated at US\$2.4 million per year.

8. **Though no health data were collected at the project sites, a benefit of just under US\$10 per person living in the area was estimated based on a reduction in the prevalence of sanitation-related diseases (mainly diarrheal disease).** A total of just over US\$2.1 million a year, based on the

<sup>17</sup> The discount rate used at appraisal was high (10 percent) and it is now recommended by the World Bank Sustainable Development (SD) Chief Economist that a discount rate of six percent is used.



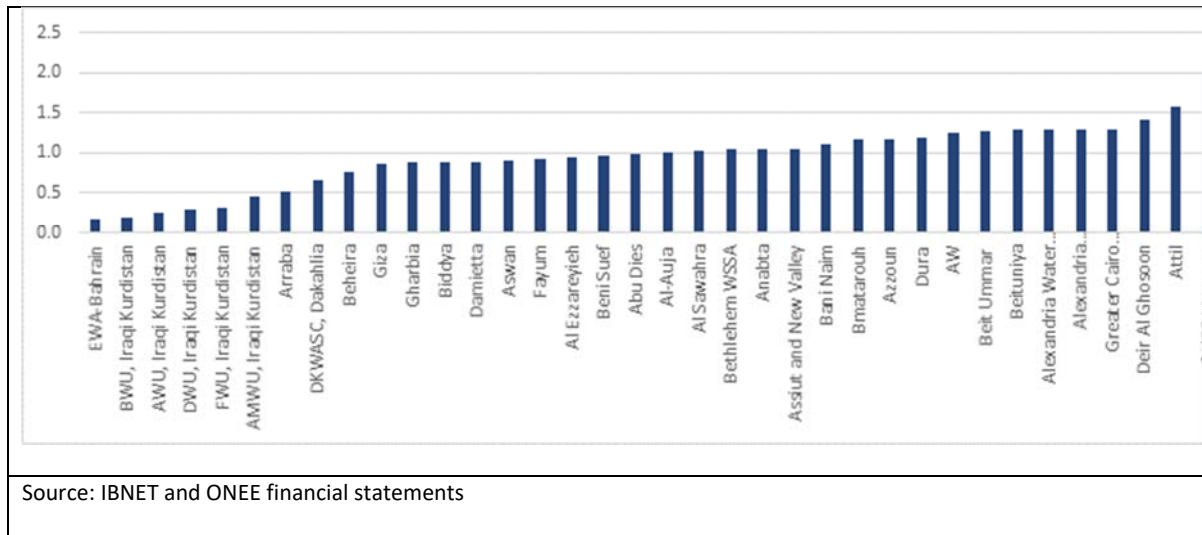
productivity losses, was attributed to the project.

9. In conclusion, while the ERR estimated at appraisal based on producer and consumer surpluses – through the tariff and land prices respectively – did not materialize, other benefit streams were estimated based on benefits identified, but not quantified, at the time of appraisal. These benefits included: (i) savings from septic tank emptying; (ii) wastewater reuse in agriculture; (iii) reduction in environmental pollutants; and (iv) health benefits. These combined benefit streams are estimated to be around US\$5.7 million per year. This combined benefit stream over a 40-year period at a discount rate of six percent generated an NPV of US\$33.6 million or an ERR of 9.4 percent (as shown in Table A4.1).

Financial Analysis of ONEE as whole

10. **ONEE’s operating cost coverage ratio for its combined water and sewerage operations is well above the regional average.** ONEE is a regional leader in its financial performance. Before depreciation, interest and tax charges ONEE’s combined water and sewerage operations generate a positive cash flow, reporting an operating cost coverage ratio of just under 2 over the 2010 to 2015 period (see Figure A4.2 for additional details).

Figure A4.2. Operating Cost Coverage Ratio (average 2010-2015)



11. **ONEE’s financial reports are prepared on an accrual basis to reflect the full costs of operating, replacing and financing its infrastructure.** Accounting in this way is international good practice for utilities and enables the Government of the Kingdom of Morocco and ONEE to monitor and report on its performance relative to full cost recovery. ONEE is responsible for repaying both principal and interest on its borrowing.

12. **On this basis, ONEE’s sewerage operations are loss-making under the existing tariff structure.** This means that revenues from ONEE’s water services are used to cross-subsidize sewerage operations. The cross-subsidy from ONEE’s water operations to its sewerage operations totaled 413



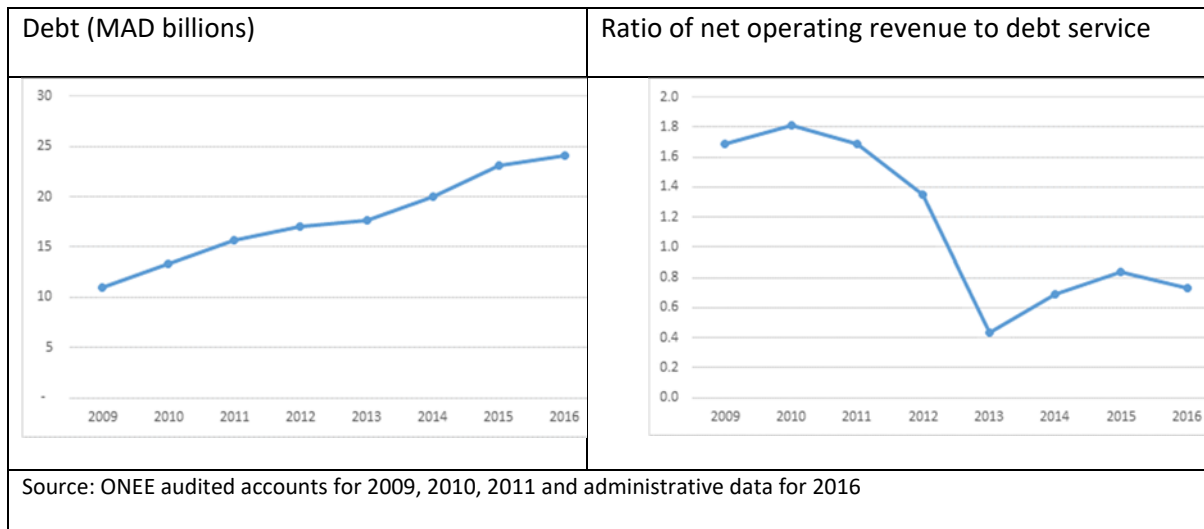
million MAD (US\$42 million) in 2016. This included 343 million MAD (US\$35 million) to cover operational losses and depreciation as well as a further subsidy of 74 million MAD (US\$8 million) to cover sewerage related debt service.

13. **In 2016 the cross-subsidy to sewerage services resulted in ONEE reporting a deficit of 129 million MAD (US\$13 million).** Sewerage operations consumed 63 percent of ONEE’s operating surplus, and, after debt financing, resulted in a deficit for ONEE’s water branch. While this deficit was only a small proportion of ONEE’s turnover (2 percent), cross-subsidizing sewerage services is constraining ONEE’s overall cashflow.

14. **Without increasing sewerage tariffs, the burden of cross-subsidizing sewerage will grow as the coverage of sewerage services is expanded across urban areas of Morocco.** The average tariff for sewerage services is just under 2 MAD/m<sup>3</sup> only slightly above that at appraisal (1.45 MAD/m<sup>3</sup>) and well below the 5.30 MAD/m<sup>3</sup> anticipated to be achieved by 2020 (based on projections at the time of appraisal). Sewerage services are a relatively small proportion of ONEE’s operations – around 15 percent of ONEE’s total operational expenditure. At existing levels of tariff and operational efficiency the expansion of sewerage services would further erode revenues generated by ONEE’s water operations.

15. **Debt relating to water and sanitation investments has doubled in eight years and the debt service has become unsustainable.** By 2016, ONEE had accumulated 24 billion MAD (US\$2.5 billion) in debt for capital projects with external financing institutions. The cost of servicing this debt was just under 750 million MAD (US\$76 million) in 2016. The ratio of net operating revenues to debt service has fallen to 0.7 in 2016 from 1.3 in 2009. This is below the target ratio of 1.2 agreed at negotiations and documented at appraisal. Figure A4.3 shows the trends in debt and operating ratio for ONEE’s Water Branch.

Figure A4.3. Financial data for ONEE’s Water Branch



16. **There is less transparency in the financial operations of ONEE’s water branch since it was merged with electricity in 2012.** The audited accounts do not present the results of water and



electricity separately. Though administrative data for ONEE's water branch was provided for 2016, these data only showed the revenue and expenditure component of the financial statement not the balance sheet or cash flow components. On the positive side, the administrative accounts did disaggregate the sanitation from the water operations.

*Financial Analysis at town level*

17. **ONEE recognize that the sewage business is loss-making and through this project were looking for solutions – an original objective of this project.** ONEE was only in the water business in 2007/08 but was mandated by the Government to take over management of sewage operations previously built and managed by municipalities. One of the original objectives of this project was, therefore, to pilot non-conventional technologies for wastewater treatment systems in selected locations, with a view to reducing costs and solving other operational problems, such as reducing environmental pollution and nuisance conditions (e.g., odors) generated at some plants.

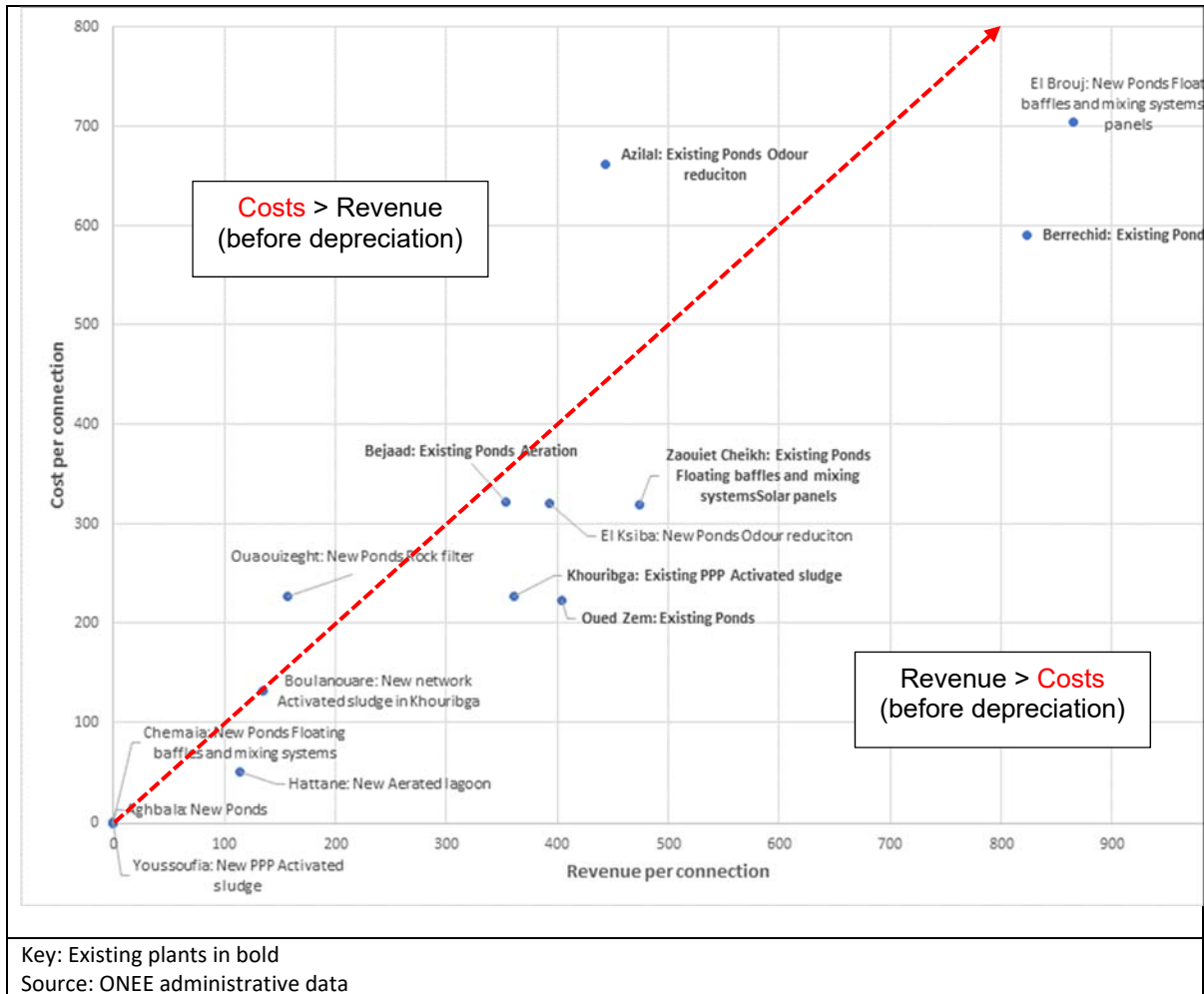
18. **Though this objective was dropped from the PDO, the project did undertake a series of pilots.** The project expanded 6 existing systems and built eight new systems (sewage collectors and treatment plants). Of these, two systems (Youssofia and Khouribga) are connected to a WWTP that is managed by a mining company through a Public-Private Partnership arrangement in exchange for the company using the treated water from the WWTP. The systems also covered a range of technologies (e.g., ponds, lagoons, activated sludge) supplemented with additional pilot technologies (e.g. floating baffles, rock filters, odor reduction etc.) aimed at improving removal efficiencies, effluent characteristics and odor conditions.

19. **Not all WWTPs were finalized by 2016, so financial data at the town level do not yet fully reflect the operational costs of all project-built infrastructure.** The most recently available financial data was from 2016. The project financed a combination of new infrastructure and extensions to existing (in bold) sewage infrastructure (Figure A4.4 shows existing plants in bold). Some of the WWTPs had not started operating in the last year for which there is financial data, including: Aghbala, Chemaia and Youssofia.

20. For the WWTPs that were operational in 2016, existing plants had higher costs per customer connection than did the new plants. With the exception of El Brouj, existing plants had higher revenues and costs per connection. Nine of the WWTPs had revenues greater than costs per connection. At Azilal and Ouaouizeght, the systems had higher costs than revenue per connection (see Figure A4.4).



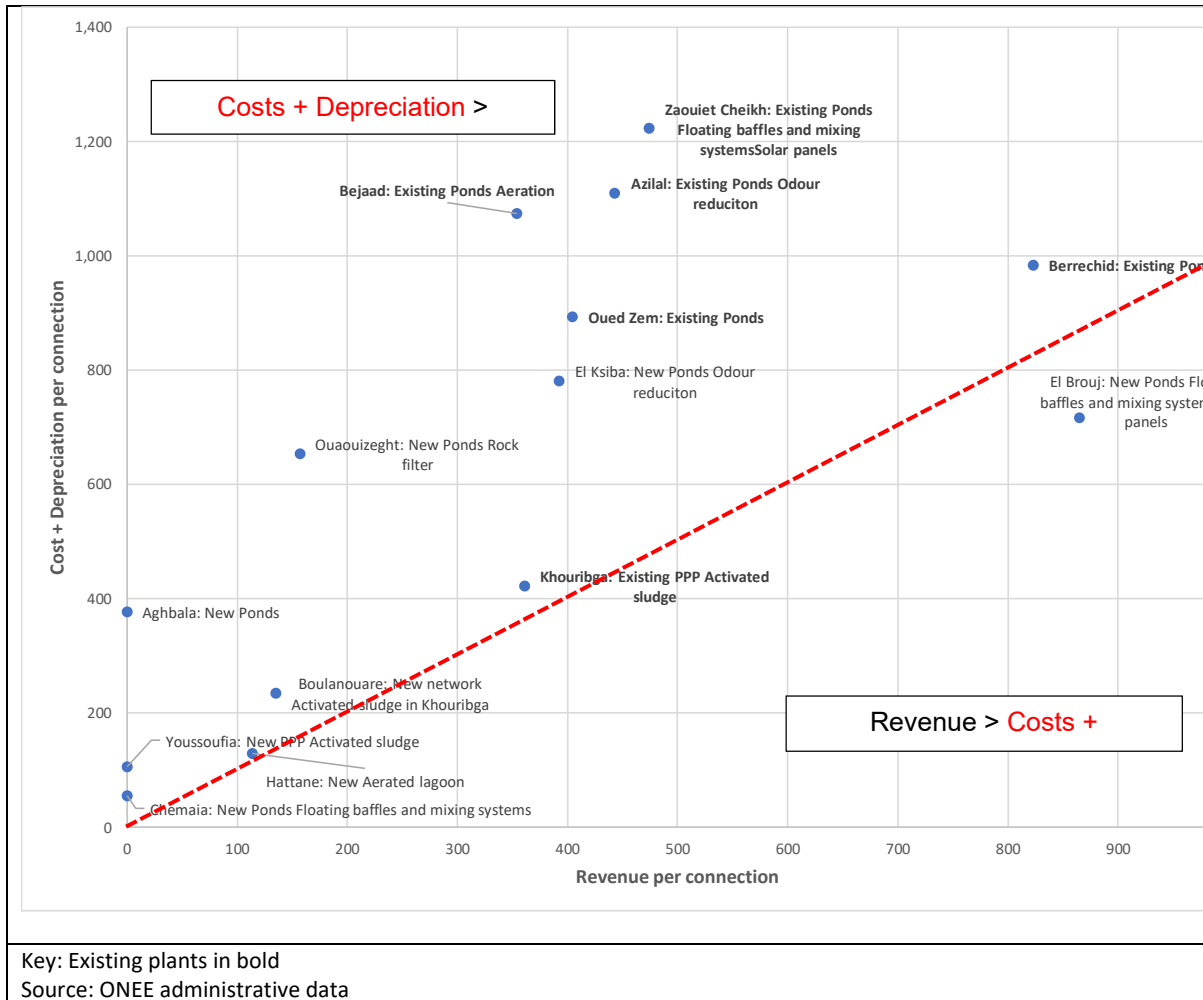
Figure A4.4. Revenue *versus* cost per connection for WWTPs in Oum Er Rbia valley (MAD)



21. When depreciation charges are included, existing WWTPs made larger losses per connection than did the new plants (see Figure A4.5). This suggests that the capital depreciation charges of the existing plants were higher than the new plants reflecting their greater original capital costs. Of the existing WWTPs, Khouribga, which is managed through a Public-Private Partnership, is the closest to full cost recovery. Though the mining company manages the WWTP itself, ONEE still covers costs of maintaining the sewage network as well as collecting revenues from the households.



Figure A4.5. Revenue *versus* cost + depreciation per connection for WWTPs in Oum Er Rbia valley (MAD)



22. **Additional years of financial data would be needed to establish whether the new systems are more efficient than the existing systems.** It is too early to establish whether the new systems are more efficient than the existing systems. Additional years of financial data would also be necessary to establish whether extensions and adaptations to the existing systems have made them more efficient. The towns that the project targeted have an annual population growth rate of 1.3 percent and not all households were connected. Connecting these additional potential customers to reach universal access would help those systems with an operational surplus (where revenue is higher than costs per connection) as depreciation will fall as turnover increases to use the full capacity of the WWTPs.

23. **At the project level an US\$82 million loss is projected at existing tariff levels. The actual returns at ICR look far worse than the negative return estimated at appraisal.** This is due to the far higher actual O&M costs reported by ONEE. Because of this significant loss at existing sewage tariff levels (scenario A), two other scenarios were examined for their returns. Scenario B used the tariff increase projected at appraisal which was 2.5 MAD per cubic meter increasing at 0.1 MAD per year.





Scenario C used a tariff of US\$1 per cubic meter of sewage. Only scenario C had a positive financial rate of return approaching that required for full cost recovery. A minimum effective tariff of US\$0.68 would be required to cover the cost of borrowing at IBRD rates. Table A4.1 summarizes the results of the economic and financial analyses at appraisal and at the time of the ICR.

**Table A4.1: Economic and financial rates of return (ERR and FIRR) under three scenarios**

	ERR (%)	Economic NPV (\$)	FIRR (%)	Financial NPV (\$)
<b>At Appraisal</b>	11%	\$4,000,000	5.7	(\$9,000,000)
<b>Scenario A - At existing tariff structure</b>	9.4%	\$33,629,618	-	(\$81,973,036)
<b>Scenario B - At higher tariff structure proposed in PAD</b>	9.5%	\$34,361,740	(3.1%)	(\$58,996,535)
<b>Scenario C - At \$1 per m3</b>	15.7%	\$103,815,276	8.6%	\$40,193,395

*Overall conclusion of the Economic and Financial Analysis*

24. While the ERR estimated at appraisal (based on producer and consumer surpluses – through the tariff and land prices respectively) did not materialize, other benefit streams were generated including (i) savings from septic tank emptying; (ii) wastewater reuse in agriculture; (iii) reduction in environmental pollutants; and (iv) health benefits. **These combined benefit streams are estimated to be about US\$5.7 million a year, which, at a discount rate of six percent,<sup>18</sup> generated a positive NPV of US\$33.6 million.**

25. **Compared to other water supply and sanitation utilities in the Middle East and North Africa (MENA) region, ONEE reports strong financial indicators including high operating cost coverage ratio well above the regional average.** However, along with its relatively strong financial position, it has responsibility for covering both principal and interest payments on its borrowing for expansion as well as responsibility for replacement of existing infrastructure. As a result, it is one of the few utilities whose accounts make it possible to monitor its performance on a full cost recovery basis. On this basis and at current tariff levels, its sewerage operations are loss-making and so cross-subsidized by water.

26. Continued monitoring of costs and revenues from the different types of WWTPs has potential to point ONEE towards more efficient technological and management arrangements for the sewerage side of their business.

27. However, to ensure that its sewage operations become self-financing over the medium-term, ONEE will need to pursue the combination of immediate and regular tariff reviews, efficiency improvements and expansion of the sewage network to unconnected households.

<sup>18</sup> The discount rate used at appraisal was 10 percent, but the present analysis uses a discount rate of 6%, as per the 2016 recommendations of the World Bank’s Sustainable Development Chief Economist.





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

### *Selected sections from Borrower ICR*

1. The Borrower (ONEE) elaborated a complete ICR for the Oum Er Rbia Sanitation Project (referred to as “BIRD III”) with thorough accounts of project implementation for each beneficiary town, including technical, environmental and social safeguards, procurement and financial management aspects. Details provided were incorporated into the Bank’s ICR where appropriate, and this Annex will thus only provide additional information on key aspects of the project.
2. *Implementation arrangements.* Key aspects of the implementation arrangements were summarized in the Borrower’s ICR:
  - ONEE’s Water Branch, particularly its Directorate of Sanitation and Environment (DAE), implemented the project in close coordination with and with the support of two of its regional directorates (*Direction Régionale* or DR), i.e. DR2 (Tensift-Marrakech) and DR3 (Centre-Khouribga). Implementation was the responsibility of ONEE’s existing structures, under the coordination of a project manager appointed within the DAE, and the technical assistance (TA) firm which was hired to support implementation helped strengthen its institutional and technical capacities over the course of the project;
  - The regional directorates, with the support of ONEE’s central services, oversaw the technical aspects of the sub-projects, including community mobilization efforts and works carried out over the course of the project by companies and consulting firms. The regional directorates were also responsible for the publication of calls for tenders and the award of contracts, while the ONEE’s central Directorate of Supplies and Procurement (DAM) managed the tenders for the studies carried out by the DAE;
  - Before the project, communes, under the supervision of the Ministry of the Interior, were responsible, among other things, for the supply of drinking water and sanitation services (“liquid sanitation”) for towns and centers under their jurisdiction. For all towns under the project, communes had already transferred responsibility for water supply to ONEE, and after developing in principle agreements with communal councils with regards to the transfer of the management of sanitation services to ONEE, “Delegated Management Agreements” were signed before works could begin in each town. In addition, communes needed to provide evidence satisfactory to both the Borrower and the Bank that all procedures for the acquisition of and financial compensation for land required for treatment plants and pumping stations had been complied with. Communes contributed 50 percent of the costs of the subprojects (collection networks, treatment plants and maintenance equipment);
3. *Communication and consultations with beneficiary populations.* The involvement of beneficiaries was considered essential to the success of the project. Feasibility studies thus identified the concerns of potential beneficiaries and took their needs and expectations into account at the project design level, in order to facilitate the connection of households to future sanitation services. On the other hand, the project worked to develop a very proactive communication strategy to promote the benefits of the project and thus increase the connection rate and raise the financial contributions of the communal governments involved. Through these awareness and mobilization campaigns, ONEE was better able to meet the needs of end-users, particularly women as the main users of the sanitation service within households.



4. *The special case of Boujaad: the rehabilitation of the sewerage network in the Old Medina* (registered National Heritage since 2004). This case deserves special attention as a section of the rehabilitation works of the Old Medina's sanitation network was located in the right-of-way registered under the National Heritage list<sup>19</sup>. As a result, OP 4.11 "Physical Cultural Resources" was triggered, as well as the equivalent national policy, and the Bank carried out an analysis of the country system in terms of heritage conservation and management against the guidelines of OP 4.11. A note was prepared to complement the country system diagnosis performed during project preparation in 2010, as the original diagnostic focused on aspects related to environmental assessment and land acquisition.

5. Due to the dilapidated state of certain areas in the Old Medina, and the substantial risk of collapse, ONEE suspended the network rehabilitation works in the medina, in order to contract out a study of technical alternatives and initiate consultations with the commune to define measures to prevent and mitigate the potential risks of housing collapse, as well as to ensure the safety of residents. At the request of the DAE, a visit to the Old Medina took place on December 21, 2016 in the presence of social and environmental safeguards experts from the World Bank, ONEE's central and regional teams (DAE, DR3), the TA firm, the company in charge of the works and two independent experts in geotechnics and civil engineering.

6. The population of the Medina of Boujaad, who had strongly requested the rehabilitation of their sanitation network, was informed about the results of the independent technical expertise commissioned by ONEE for this purpose, in particular with regards to: (i) the very high risks of collapse related to the poor quality of the soil, foundations and buildings, and (ii) the appropriate technical methodologies to execute the works according to the identified risks. The alternative which was finally adopted was trenchless sewerage pipe repair and lining ("*chemisage*"), which would allow the works to avoid the risks associated with the earthworks and with digging trenches in narrow medina streets. The TA firm mobilized an expert from June 28 to 29, 2017 to establish the procedures to be followed for the realization of the rehabilitation works, and works were finally completed in May 2018.

7. In addition, ONEE provided comments on the World Bank ICR on November 19, 2018, which were incorporated into the document. In particular, these comments served to add clarity on the rationale behind and circumstances around the different project restructurings, as well as on the reasons why certain towns were removed from the project scope.

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<sup>19</sup> According to Order No. 2.04.80 published in Official Bulletin No. 5191 on March 1, 2004.



## ANNEX 6. SUPPORTING DOCUMENTS

### Project Papers

Restructuring Paper (June 2, 2014), Report No. RES14190 22-Dec-2017-

<http://documents.worldbank.org/curated/en/297341468052843183/pdf/RES141900P098400Box3852222B000UO090.pdf>

Restructuring Paper (May 9, 2013), Report No. 75048-MA -

<http://documents.worldbank.org/curated/en/602881468062959846/pdf/750480PJPROv100377315B00PUBLIC00ACS.pdf>

Project Appraisal Document (May 20, 2010), Report No. 49332 - MA -

<http://documents.worldbank.org/curated/en/465391468052846159/pdf/493320PAD0P098101OfficialUseOnly1.pdf>

### Financing Agreements

Amendment to Loan Agreement (June 18, 2014), Loan No. 7925-MA -

<http://documents.worldbank.org/curated/en/993631468052797862/pdf/RAD822959691.pdf>

Loan Assumption Agreement (September 18, 2013), Loan No. 7925-MA -

<http://documents.worldbank.org/curated/en/225771468279939694/pdf/Ln7925-MA-LA.pdf>

Original Loan Agreement (August 19, 2010), Loan No. 7925-MA -

<http://documents.worldbank.org/curated/en/969371468275663037/pdf/L79251Oum0Er0R1tation1LA1Conformed.pdf>

Guarantee Agreement (August 19, 2010), Loan No. 7925-MA -

<http://documents.worldbank.org/curated/en/848331468279551396/pdf/L79251Oum0Er0R1tation1GA1Conformed.pdf>

### Additional Documents

Implementation Status and Results Reports and Safeguards Documents -

<http://projects.worldbank.org/P098459/morocco-oum-er-rbia-sanitation?lang=en&tab=documents&subTab=projectDocuments>

Citizen Engagement in Water Snapshots: Morocco – Oum Er Rbia Sanitation Project (May 2017) -

<http://documents.worldbank.org/curated/en/147031501045871254/pdf/117749-REVISED-Morocco-Citizen-Engagement-Snapshot-Final-External.pdf>

Country Partnership Strategy for the Kingdom of Morocco (FY14-FY17), Report No. 86518-MA -

[http://www.worldbank.org/content/dam/Worldbank/document/MNA/moroccocps/Morocco\\_CPS\\_FINAL.pdf](http://www.worldbank.org/content/dam/Worldbank/document/MNA/moroccocps/Morocco_CPS_FINAL.pdf)

Mission Environmental Reports for Aghbala and Ouaouizeght WWTPs (October 2015 and January 2016).

ONEE, 2018. *Rapport d’Achèvement: Programme de Dépollution du Bassin de l’Oum Errabia (BIRDIII)*.

Rural Water Supply Project Loan Agreement, P145529 (May 2014), Loan No. 8397-MA –

<http://documents.worldbank.org/curated/en/787071468052162276/pdf/RAD983598418.pdf>



## ANNEX 7. REVIEW OF THE PERFORMANCE OF THE SAFEGUARDS APPROACH THROUGH THE USE OF COUNTRY SYSTEMS & CITIZEN ENGAGEMENT DURING PROJECT IMPLEMENTATION

### Use of Country Systems (UCS)

1. *Background.* The Project adopted the piloting of the UCS for the environmental and social safeguards aspects and triggered three of the eight safeguards that could be subject to piloting under OP 4.00. "Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects," i.e., (i) Environmental Assessment (EA); (ii) Involuntary Resettlement (IR); and (iii) Physical Cultural Resources. These three safeguards were triggered because project activities were expected to have environmental impacts during and after construction, activities included land acquisition by the municipal authorities for the construction of wastewater treatment plants (WWTPs), pumping stations and the installation of sewerage networks; and works were added in the Medina of Boujaad, which is a national heritage site.

2. Considering the advances that had been made by Morocco's environmental protection legislation and environmental impact assessment (EIA) regulations, and recognizing ONEE's capacity and compliance track record, it had been decided that the UCS and procedures for the environmental assessment and land acquisition aspects of the Project would present a relatively low risk. It was further argued at the time of appraisal that local communities in Morocco would be presented with better opportunities to have their voices heard in matters of environmental and social safeguards through UCS, particularly with regards to land expropriation for public use, and by adhering to local regulations and practices, rather than those of international donors, it was hoped that both the level and quality of sanitation services would be improved.

3. *Assessment of country systems and performance of OP 4.00 pilot.* An assessment of the country systems or Safeguards Diagnostic Review (SDR), including Equivalence and Acceptability Analyses, was completed as per OP/BP 4.00, and, in particular, the Objectives and Operational Principles set forth in Table A1 of OP 4.00. The World Bank financed the development of the SDR, which was finalized and disclosed on March 22, 2010. This assessment highlighted the following:

- a. The Equivalence Analysis concluded that the totality of Moroccan laws, regulations, administrative orders and guidelines applicable to EA and IR in the water and sanitation sector were in nearly complete harmony with the Objectives and Operational Principles of OP 4.00, Table A1 and that the equivalence gaps could be remedied within the scope and term of the proposed project by updating the ToRs for EIAs to be carried out for the sanitation-related investments and activities implemented under the Project;
- b. The Acceptability Analysis identified a number of gap-filling measures for which ONEE was responsible, as presented in Table A7.1, along with how these measures were fulfilled throughout the life of the Project.

4. The SDR also recommended conducting an external evaluation of its implementation, focusing in particular on land acquisition, which was finalized in September 2015. As recommended by the OP 4.00 Operational Manual, this review also documented changes in applicable legislation, regulations, rules or procedures, as well as the effect of those changes on project implementation.



**Table A7.1 Gap-filling measures from the Acceptability Analysis and outcomes**

Gap-filling measure	Outcome
<p>[EA] Improve the EIA ToRs for sanitation sub-projects to be used during project implementation.</p>	<p>This was completed successfully, including all recommended elements during the Acceptability Analysis, such as: (i) conducting alternatives analysis including the “no project” alternative to all sub-projects; (ii) providing detailed mitigation measures, institutional arrangements for their implementation and monitoring, and a budget for each proposed mitigation measure. These measures were also included in bidding documents and contracts for the construction of each sub-project; (iii) identifying and implementing capacity strengthening activities; (iv) ensuring that EIAs are prepared by experts independent from the engineering and design study experts; (v) holding public consultations with local communities and stakeholders in view of informing them about the sub-projects in their area and their impacts on the environment and to collect their feedback and comments on the sub-project construction and operation; and (vi) disclosing final EIA reports on the ONEE website.</p>
<p>[IR] Provide assistance to beneficiary municipalities with land acquisition processes for each sanitation subproject.</p>	<p>A “Land Acquisition Focal Point” was appointed at ONEE to coordinate and accelerate land acquisitions and compensations under the project. The Focal Point was trained in land acquisition requirements and policies, and was responsible for building the capacity of and assisting municipalities in following procedures to acquire land, including informing landowners of their rights and of potential compensations. The Focal Point also ensured that regular consultations and meetings were held with the PAP before acquisition in order to seek their agreement and accompany them throughout the compensation process, and offered pro bono support to help finalize the necessary documentation for land acquisition. In essence, the Focal Point managed to create a unique, personalized interface between landowners, local authorities and technical teams, as well as facilitate the convergence of technical and social solutions, such as modifying the layout of transfer pipes on the basis of consultations with landowners.</p>
<p>[IR] Monitor and document the land acquisition and compensation processes. ONEE was to request the necessary information from beneficiary municipalities <u>before</u> the start of construction of sanitation sub-projects. In that sense, compensation was also to be paid prior to the commencement of works.</p>	<p>With the support of the World Bank social safeguards team, ONEE developed a “Land Acquisition Monitoring Matrix” which was regularly updated and sent to the Bank between and prior to supervision missions, as needed. The World Bank social safeguards specialist provided continuous support to the ONEE team, particularly the Land Acquisition Focal Point, and the Matrix allowed the supervision teams to clearly identify where additional effort needed to be concentrated in order to allow all works to start in a timely manner. In addition, and in order to help speed up the acquisition and compensation processes, local and central authorities (the Local Authorities General Directorate of the Ministry of Interior, the <i>Direction Générale des Collectivités Locales</i> [DGCL]) were sensitized and mobilized by ONEE teams at both central and local levels.</p> <p>Through this process, ONEE collected for each lot of land to be acquired: (i) maps and survey documents; and (ii) the legal documentation, including land titles, contracts through which the land is acquired (in the case the land is owned by an individual or community under the “Melk” regime, or the “Habous” regime), or agreements for land transfer with the minutes of municipal councils, including a decision on a budget allocation set aside for compensation, and receipts of compensation payments, in the case of “willing buyer-willing seller” arrangements for public interest purposes.</p>
<p>[IR] Disclose procedural acts related to land lot acquisition and consultation of affected persons.</p>	<p>All documentation relating to land acquisition and compensation processes was filed and archived, and is publicly available.</p>



5. *Capacity strengthening and sustainability.* The Project included technical assistance (TA) for the project management team within ONEE, which included safeguards-related aspects. This TA first took the form of training the ONEE Land Acquisition Focal Point, as well as developing the monitoring tools required to institutionalize the approaches developed under the Project. In addition, support from the World Bank social safeguards specialist was not only limited to land acquisition, and also included support in developing the Project's Grievance Redress Mechanism (GRM), incorporating ONEE's Regional Communication Cells and technical staff (see details below on GRM). A gradual handover of the monitoring responsibilities (beyond what the Bank team would need to do during project supervision) was done over the years to ensure that ONEE staff drove the process and understood the critical importance of coordinating social/land acquisition/GRM aspects with technical aspects associated with the sanitation sub-projects. A number of workshops were organized over the years to gradually institutionalize the approaches developed under the Project, including a project closing workshop on July 10, 2018 which provided an opportunity to present the success of these approaches, as well as lessons learned, to a broader ONEE audience, including the central Sanitation Department, other regional units (other than the two which were part of project implementation), as well as ONEE's Drinking Water Branch, amongst others.

6. Given the positive outcomes, as described in Table A7.1, as well as the institutionalization of the approaches developed (including the Land Acquisition Focal Point which is now a permanent staff position within ONEE), it can be said that the UCS was successful. Considerable capacity building was necessary at the early stage of implementation, but it was shown that the UCS ultimately demonstrated its relevance and effectiveness in achieving the Bank's safeguard policies objectives, as well as in the application of its operational principles. It is however important to note the following elements which can help "relativize" the success of the UCS for this particular project, and may not allow it to be generalizable and applicable to other contexts:

- a. The Moroccan country systems were not completely aligned with OP 4.12 requirements, and ONEE therefore adjusted its protocols for land acquisition in order to meet the Bank's requirements. In this case, ONEE has now seen the value in adopting the protocols which were strengthened as part of the Project, but one may question whether the direct application of OP 4.12 would have achieved similar results, both in terms of achieving project objectives and in terms of institutionalizing improved procedures for land acquisition;
- b. All land acquisitions under the Project made in the framework of the UCS did not result in any physical resettlement of populations, and also had limited economic impacts. No house or other building were documented on the land lots which were acquired, and the land was either bare or used for cereal agriculture with a small number of fruit trees (which were all compensated for). Parcels which were acquired were also, for the most part, considered small: out of a total of 134 parcels, 83 measured less than 1 hectare, of which 58 parcels were of an area less than 0.05 hectares. All PAPs were the owners of the parcels and acquisitions were made on a voluntary basis, with the majority of cases resulting in negotiations concerning the property transfer price.

### **Citizen engagement**

7. Although citizen engagement activities were not part of the original project design, they were added in an organic and gradual manner in response to the project's needs. Buoyed by the enabling national context, which had recently showed signs of openness towards participatory and inclusive approaches to engage with the population, PAPs were more prone to voice their concerns and opposition,





stemming from anticipated bad odors emanating from WWTPs, illegal connections and complaints related to connection costs and temporary inconvenience related to works. Challenges and delays encountered during project preparation led ONEE and the Bank team to address the community's concerns by rethinking its approach and to adopt an array of tools to engage with the local community and all stakeholders. On top of the appointment of a Land Acquisition Focal Point described above, the Project also put in place the following:

8. Local Monitoring Committees. Local Monitoring Committees were established and were comprised of local authorities, contractors, the external technical assistance or supervision firm, ONEE and influential and trusted local actors, including traditional leaders. These committees would ensure a clear and continuous flow of communication between citizens and project authorities, and were set up at each work site, holding weekly meetings open to the public to communicate consistent information to all stakeholders, respond to citizens' demands and grievances. This arrangement allowed parties to make joint strategic and technical decisions, which alleviated concerns, and helped reduce the social impacts of land acquisition and the risk of opposition. When local community and committees included local population and communities, ONEE ensured that its designated staff could speak the local dialect or language (e.g., Berber) to facilitate interactions.

9. Meaningful Consultations and Public Information Campaigns. The regional Communication Cells of ONEE were in charge of ensuring smooth interactions with populations and contributing to the proper functioning of the citizen engagement mechanisms. They were made up equally of men and women in order to better interact with the community during door-to-door activities, consultations, and meetings. To raise awareness, the Communication Cells organized large community events such as debates and sports and cultural events, distributing flyers, t-shirts and hats. They also managed social teams, mainly in charge of door-to-door interactions, to present the content, objectives and potential impacts of the project and its benefits in terms of health and hygiene.

10. In the specific cases of populations living near WWTPs, social teams informed the populations living nearby – a prior mapping of these populations had been developed – about the treatment process and the mitigation measures to be put in place to address potential negative impacts (such as odors). Site visits to WWTPs and pumping stations were also organized for the nearby populations. In addition, two satisfaction surveys concerning the piloting of WWTP odor reduction measures were carried out in the rural community near the Azilal WWTP: the first before the implementation of the pilot project, and the second after odor reduction measures had been put in place (April 2016), in order to assess the level of perception related to odors depending on location, proximity and wind direction. Through the use of these surveys, ONEE hoped to test the piloted solution before expanding it other WWTPs of the project (and beyond), and results were very positive: while odor nuisance was initially considered strong with 83% of the respondents, 85% of those surveyed after the installation of the pilot reported satisfactory improvements with regards to odors.

11. Social teams also closely tracked the progress of sewerage networks, to consult connecting households just in time to explain benefits and payment facilities.<sup>20</sup> Any of those interactions became an opportunity to inform local populations about the existence of different channels for gathering

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<sup>20</sup> Under the project, and in line with the PNA approach, the costs for connections were financed with 50 percent funding from ONEE and the remaining 50 percent paid by the Municipality. In cases where insufficient funds were available to connect all households, priority neighborhoods (e.g., the poorest neighborhoods) were selected to benefit from the subsidized costs.



grievances, and respond to any water, sanitation or water-related issues, concerns or complaints.

12. GRM. A GRM system was put in place progressively, first in two pilot towns, then across the Project, and its design was largely adapted to the local context. It established multiple ways of collecting grievances, taking into account the long tradition of orality in project areas. The ONEE Communications Directorate (at the central level) and its regional Communications Cells provided strong technical support to strengthen local ONEE teams, while also capturing effective local practices and sharing them across ONEE offices. Tools and channels for collecting, recording, and monitoring grievances (including oral grievances) were developed. Roles and processes were well-defined for each actor, and training was provided regularly. Complaints logs were redesigned and improved, and the information collected was consolidated by regional ONEE offices and then reported to ONEE's central team in Rabat. The team analyzed the data to identify trends, emerging issues, or areas of improvement, and then fed it back to local teams. In addition, during project implementation, biannual reports were prepared and submitted to the Bank. By addressing the actual needs of local teams to respond to citizens and resolve their grievances, the GRM system successfully built local support, which enhanced its effectiveness.

13. In light of the satisfactory results of the use of these tools, ONEE's Central Communication Department decided to use the GRM for all its sanitation projects, and the approach developed under this Project was documented as one of the best regional practices by the Water GP's citizen engagement team. A "Snapshot" was published in that sense and is available at: <http://documents.worldbank.org/curated/en/147031501045871254/Citizen-engagement-in-water-snapshots-Morocco-Oum-er-Rbia-sanitation-project>.





**ANNEX 8: SUMMARY OF REVISIONS TO PDO INDICATORS LINKED TO PROJECT RESTRUCTURINGS**

Outcome	Original Indicator (target)	Revised Indicator, after June 2014 restructuring (target)	Revised Indicator, after May 2017 restructuring (target) <sup>a</sup>
Increase access to sewerage services <i>(revised to read: "increase access to sanitation services")</i>	Number new sewerage connections provided under the project (13,000 connections)	Direct project beneficiaries (220,000)	Direct project beneficiaries (220,000)
		Female beneficiaries (50 percent)	Female beneficiaries (50 percent)
		Extremely poor beneficiaries (15 percent)	Extremely poor beneficiaries (15 percent)
		Number of people in urban areas provided with access to improved sanitation under the project (130,000)	Number of people in urban areas provided with access to improved sanitation under the project (130,000)
		Rate of access to sanitation services in selected towns (65 percent)	Percentage of population in project area whose wastewater is collected (90 percent)
			Percentage of population in project area whose wastewater is appropriately treated (90 percent)
Reduce wastewater-related pollution	Number of WWTPs complying with national standards (3 out of 4 samples in compliance every year (10)	WWTPs constructed under the project complying with national discharge standards (6) <sup>b</sup>	WWTPs constructed under the project complying with national discharge standards (6) <sup>b</sup>
	Volume (mass) of BOD pollution loads removed by treatment plants financed under the project (1,830 tons/year)	Volume (mass) of BOD pollution load removed by treatment plant under the project (800 tons/year) <sup>c</sup>	Volume (mass) of BOD pollution load removed by treatment plant under the project (800 tons/year) <sup>c</sup>
Pilot non-conventional technologies for wastewater treatment systems	Number of non-conventional systems piloted (4)	<i>dropped</i>	<i>dropped</i>

<sup>a</sup> The initial revisions to the RF took place as part of the June 2014 restructuring. In May 2017, as part of a Level II restructuring, additional changes were made to the RF, including two changes to intermediate results indicators and the addition of the PDO-level indicator "Percentage of population in Project area whose wastewater is appropriately treated." This indicator was added to reflect the overall improvement in sanitation services under the project. Annex 8 shows the PDO indicators for all three phases of the RF.

<sup>b</sup> The number of plants was reduced from ten to six as the revised indicator only includes WWTPs that were constructed under the project, and not those that were already existing prior to the project.

<sup>c</sup> The target for this indicator was reduced following the restructuring though no clear rationale was presented for the dramatic reduction in the target.



**ANNEX 9: SUMMARY OF WWTPs IMPACTED**

Centre	Technologies	Nature of works	Piloting, if any	WWTP (new or existing)	Year Put into Service	Compliance	Volume of BOD removed (ton/year)
El Ksiba	treatment ponds	new WWTP; rehabilitation of network	odor reduction pilot	new	2016	n/a <sup>2</sup>	161.0
Ouaouizeght	treatment ponds	new WWTP; rehabilitation and extension of network; complementary network	rock filter pilot	new	2016	yes	45.1
El Brouj	treatment ponds	new WWTP; rehabilitation and extension of network	floating baffles	new	2015	n/a <sup>2</sup>	178.7
Boulanouare	activated sludge	rehabilitation and extension of network; OCP Group operates		n/a <sup>3</sup>	-	-	143.4
Hattane	aerated ponds	new WWTP; rehabilitation and extension of network		new	2018	yes <sup>1</sup>	143.1
Azilal	treatment ponds	rehabilitation and extension of network	odor reduction pilot	existing	2012	no	23.0
Zaouiet Cheikh	treatment ponds	rehabilitation and extension of network	mixing system, with solar panels for power	existing	2013	no	23.6
Oued Zem	treatment ponds	rehabilitation and extension of network		existing	2012	yes	34.9
Boujaad	treatment ponds	rehabilitation and extension of network	aeration added to pond	existing	2011	yes	12.3
Aghbala	treatment ponds	new WWTP; rehabilitation and extension of network		new	2016	yes <sup>1</sup>	54.2
Khouribga	activated sludge	existing WWTP operated by OCP Group; rehabilitation of network		existing	2010	yes	46.4
Youssoufia	activated sludge	existing WWTP operated by OCP Group; rehabilitation and expansion of network		existing	n/a	yes	333.2
Chemaia	treatment ponds	new WWTP; rehabilitation and extension of network	floating baffles and mixing system, with solar panels for power	new	2018	yes <sup>1</sup>	153.8
<b>TOTAL</b>							<b>1,352.7</b>

<sup>1</sup>Plants must be in operation for at least a year to be eligible for compliance. Those plants marked with a 1 have not yet been monitored for at least a year, but to date their compliance is meeting the standards.

<sup>2</sup>Not available. These plants have not yet been in operation for the full required time period, but to date have shown inconsistent performance and thus may not meet the compliance requirements.

<sup>3</sup>The network in Boulanouare connects to the WWTP in Khouribga.

Note: Berrechid is excluded from the table since it was added to the project at a later stage and equivalent information is not available.



## ANNEX 10: POPULATION DATA ON PROJECT LOCATIONS

Table A10.1: City Population Data from 2014 Census

Locations	Population (2014)	Households (2014)	Number of people per household	Households per connection	Number of people per connection	Poverty rate
El Ksiba	20,001	5,391	3.7	1.0	3.7	4.5%
Ouaouizeght	9,449	2,250	4.2	1.0	4.2	28.7%
El Brouj	19,235	3,841	5.0	1.2	6.0	17.6%
Boulanouare	12,756	2,802	4.6	1.1	5.0	23.4%
Hattane	10,618	2,364	4.5	1.1	4.9	2.2%
Azilal	38,520	8,438	4.6	1.2	5.5	12.1%
Zaouiet Cheikh	25,388	6,614	3.8	1.5	5.8	10.1%
Oued Zem	95,267	21,724	4.4	1.5	6.6	6.3%
Boujaad	46,893	11,091	4.2	1.5	6.3	7.7%
Aghbala	6,745	1,776	3.8	1.0	3.8	56.6%
Khouribga	196,196	43,487	4.5	1.7	7.7	2.6%
Youssofia	67,628	14,762	4.6	1.2	5.5	3.7%
Chemaia	24,303	4,911	4.9	1.0	4.9	5.9%
Berrechid	136,634	31,705	4.3	2.0	8.6	3.2%
<b>TOTAL</b>	<b>709,633</b>	<b>161,156</b>				
<b>AVERAGE</b>			<b>4.4</b>	<b>1.3</b>	<b>5.4</b>	<b>13.2%</b>

Table A10.2: Province Population Data, by gender, from 2014 Census

Province	Population (2014)	Number of women (2014)	Percent of women (2014)	Corresponding project locations
Beni Mellal	548,776	282,066	51.4%	Zaouiet Cheikh; El Ksiba; Aghbala
Azilal	552,884	275,313	49.8%	Azilal; Ouaouizeght
Khouribga	538,325	274,122	50.9%	Boulanouare; Boujaad; Hattane; Khouribga; Oued Zem
Berrechid	482,312	236,460	49.0%	Berrechid
Settat	631,725	312,279	49.4%	El Brouj
Youssofia	251,943	123,571	49.0%	Youssofia; Chemaia
<b>Total</b>	<b>2,457,189</b>	<b>1,221,745</b>		
<i>Weighted average</i>			<i>50.4%</i>	

Average is weighted based on number of cities per province.

