



1. Project Data

Project ID

P150351

Project Name

FY16-SN Urban Water and Sanitation Proje

Country

Senegal

Practice Area(Lead)

Water

L/C/TF Number(s)

IDA-56730,IDA-60730

Closing Date (Original)

30-Jun-2020

Total Project Cost (USD)

102,138,631.32

Bank Approval Date

15-Jun-2015

Closing Date (Actual)

31-Dec-2021

IBRD/IDA (USD)
Grants (USD)

Original Commitment

70,000,000.00

0.00

Revised Commitment

100,000,000.00

0.00

Actual

102,643,103.96

0.00

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2. Project Objectives and Components

a. Objectives

According to the International Development Association (IDA) Financing Agreement (p.4) dated October 26, 2015, and the Project Appraisal Document (PAD, p.6), the project objective is “to improve access to water and sanitation services in selected urban areas in a financially sustainable manner.” The project objective is the same in the Financing Agreement signed on July 20, 2017 for an additional financing (AF).

For the analysis of this project's achievements, the project objective is parsed as follows:



1. To improve access to water services in selected urban areas in a financially sustainable manner; and
2. To improve access to sanitation services in selected urban areas in a financially sustainable manner.

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

Yes

Did the Board approve the revised objectives/key associated outcome targets?

Yes

Date of Board Approval

14-Jun-2017

c. Will a split evaluation be undertaken?

No

d. Components

According to the loan agreement, the project consisted of three components.

A. Water Supply. (*Appraisal cost: US\$48.90 million; revised cost at AF: US\$77.64 million; actual cost: US\$73.65 million*)

This component consisted of four subcomponents:

1. **Development of groundwater resources.** This subcomponent was to finance the following activities to develop groundwater resources and water storage and transmission systems in Tassette and Mbour areas to increase the availability of water and improve the quality of water services in Dakar and Petite Cote areas: (a) drilling and equipping nine new boreholes with connection pipes to collect groundwater; (b) provision and installation of 46 km of feeder pipes, two booster pumping stations and construction of two ground storage tanks; (c) construction of two elevated storage tanks; and (d) provision of goods.
2. **Rehabilitation of urban water infrastructure in the urban center of Nguekhokh.** This component was to finance the construction and rehabilitation of water infrastructure in Nguekhokh: (a) drilling and equipping two new boreholes; (b) construction of an elevated storage tank and 42 km of distribution pipes; (c) rehabilitation of standposts and approximately 1,500 household water connections; and (d) provision of goods.
3. **Access to safe water.** Under this subcomponent, approximately 1,600 km of water distribution pipes and 20,000 household water connections were to be installed in selected urban centers.
4. **Technical studies.** This subcomponent was to finance technical studies for water supply systems in Dakar and Petite Cote.

The scope of this component expanded at the time of additional financing in June 2017 (see Revised Components below).

B. Sanitation. (*Appraisal cost: US\$16.80 million; no change at AF; actual cost: US\$19.46 million*)



This component consisted of four subcomponents:

1. **Sanitation facilities in the urban center of Joal-Fadiouth.** This subcomponent was to finance three activities: (a) provision and installation of 44 km sanitation pipes, five sewage pumping stations, and 3,000 household sewerage service connections; (b) construction of a wastewater treatment plant and a sludge treatment plant; and (c) installation of 320 on-site household sanitation facilities and eight public toilets.
2. **Access to sewerage services.** This subcomponent was to finance the expansion of sewers by 55 km, construction of a pumping station, and installation of 3,015 sewerage service connections in Kaolack, Thies and Dakar, where sewerage network already existed.
3. **Supervision and communication:** This subcomponent was to support project implementation through the supervision of the activities to be implemented under the first two subcomponents, and implementing communication, information, and education activities in Joal-Fadiouth.
4. **Technical studies:** This subcomponent was to finance detailed technical studies for the development of a sanitation system for the Dakar East Zone.

C. Institutional Strengthening and Project Management. (*Appraisal cost: US\$4.30 million; revised cost at AF: US\$5.66; actual cost: US\$5.81 million*)

This component consisted of three sub-components:

1. **Capacity strengthening in monitoring and knowledge of groundwater resources:** (a) construction of piezometers; (b) provision and installation of remote monitoring equipment; and (c) hydrogeological studies for the Horst de Ndiass region.
2. **Reforms:** Support in the reforms of the water and sanitation sector.
3. **Project implementation:** Support to the project implementing entity in project coordination, supervision, financial management, communication and outreach, procurement, monitoring and evaluation, supervision of safeguards implementation.

Revised Components

Under the US\$30 million additional financing signed in July 2017, the connection between the third phase of Guiers Lake Water Supply System (ALG3 – Adduction du Las du Guiers, which is a 250 km pipeline connecting the Guiers Lake to the Dakar area) and the transmission and distribution network serving the Mbour and Petite Cote were added to the first component. The construction of this connection was to supply water from ALG3 and eliminate water shortages in the Petite Cote area. This connection was found to be the only feasible solution as “seawater desalination in the area was technically not feasible, groundwater in the Petite Cote area was already overexploited and a transmission line between Tassette and Petite-Cote was financially not feasible” (ICR, p.10). Additionally, the third component’s scope was increased to include groundwater studies and trial explorations, and the Strategic Environmental Assessment for the Water Supply Master Plan for Dakar-Thiès-Petite Côte.

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



Project Cost: The total project cost was originally estimated at US\$70.00 million. At the additional financing in July 2017, the project cost estimate was revised up to US\$100.00 million. On December 31, 2021, the project closed with a total cost of US\$98.92 million.

Financing: At appraisal, the IBRD loan was estimated at US\$70.00 million. An additional financing of US\$30.00 million was approved in July 2017. The project disbursed US\$98.92 million. All project funds were accounted for at the time of project evaluation.

Borrower's contribution: At appraisal, no borrower's contribution was estimated and none materialized by project closing.

Additional Financing and Project Restructuring: An additional financing was approved in July 2017 and the project was restructured once in January 2021:

- **Additional Financing (July 21, 2017):** An additional financing of US\$30.00 million was approved to finance the connection between ALG3 and the transmission and distribution network serving the area of Mbour and Petite Cote (see Revised Components above). To allow time for the completion of these additional infrastructure investments, the project closing date was extended by 18 months from June 30, 2020 to December 31, 2021. In accordance with the increase in the project scope, the target values of three indicators were revised up: (a) Number of people with access to enhanced water supply services under the project from 330,000 to 560,000; (b) number of direct project beneficiaries from 590,000 to 820,000; and (c) length of feeder pipes constructed under the project from 45 km to 99.5 km.
- **Project Restructuring (Level 2 - January 15, 2021):** The disbursement categories were amended to allow the use of US\$6 million credit savings from the additional financing to finance the drilling of additional boreholes and construction of sanitation pumping stations under the parent project. Additional boreholes were required because the number of negative boreholes observed was higher than expected. This had created a 1,586 cubic meter per day water production gap. These boreholes would go deeper to reach aquifers where water was available. Construction of a sanitation pumping station and a related 27.4 km of sewerage network was necessary to connect an additional 620 households to the sewerage network to achieve the project's targets.

Dates: The project was approved on June 15, 2014. The Financing Agreement was signed on October 26, 2015, and the loan became effective on January 18, 2016. An Additional Financing Agreement was signed on July 21, 2017. The Mid-Term Review was conducted in January 2020. The original project closing date was June 30, 2020. The project closing date was extended by 18 months to allow the completion of civil works under the additional financing, and the project closed on December 31, 2021.

Reason not to undertake a split assessment of the project outcome: The target value of one key associated outcome indicator was revised up in line with the expansion of the scope of the project following the additional financing. As per Bank guidance (p.17), such an upward revision of outcome indicators does not require a split assessment of the project outcome. Hence, the project's outcome will be assessed based on the revised target.

3. Relevance of Objectives



Rationale

The project objectives are highly aligned with the World Bank's current strategy as defined in the Country Partnership Framework (CPF) for Senegal, FY20-FY24. The project sought to address the development problem of spatial inequalities in access to water and sanitation because of insufficient water production and lack of water supply and sewerage networks in the capital or Dakar and other urban centers. The development problem fits under the "Objective 3.2 Ensure access to water and sanitation in the most vulnerable areas" of the "Focus Area 3: Increase Resilience and Sustainability in the Context of Growing Risks" of the CPF (pp.33-34). Since poor access to water and sanitation services disproportionately impacts women and girls because of time loss in fetching water, health burdens, and safety concerns due to open defecation, the project objectives are also aligned with the CPF's cross-cutting objective of enhancing gender equality (CPF, p.1). The project was to address these development problems by financing infrastructure investments in groundwater production, related water transmission network, sewerage network, and household and social connections to water and sewerage networks.

The project objectives are highly relevant to the country context. Despite a high access to water rate of 98 percent in urban areas and 85 percent in rural areas, water shortages are common in major urban areas of Dakar and Petite Cote and access to improved sanitation is significantly low: 62 percent in urban areas and 39 percent in rural areas (ICR, p.5). Therefore, the project objectives were appropriately pitched for the development status in the country and given the experience of the water and sanitation utilities in implementing similar projects and the government's commitment to improve access to water and sanitation nationwide, the achievability of the project objectives was substantially high.

However, while the objective remained relevant throughout the project cycle and was a necessary response to a development challenge in Senegal, a shortcoming here is the lack of clarity in the project objectives' formulation around what outcomes would be achieved through improving the access to water and sanitation services; in what ways was the project's intervention expected to improve peoples' lives? Focusing on "improved access to water and sanitation services" alone is not outcome-focused and does not help in understanding what development results were expected as a consequence of the project. Those expected results are partially described in the PAD (pp.23-26) but are not reflected in the formulation of the project objectives. These may be longer term targets but tracking them and identifying them is an important aspect of a successful development operation.

The World Bank has been a long-term development partner of Senegal in the water and sanitation sectors since 1995. The first World Bank-financed project was the Water Sector Project (1995), which was designed to address bulk water shortages and the weak financial viability of the National Water Company of Senegal (SONES - Société Nationale des Eaux du Sénégal). The second project was the Long-Term Water Sector Project (2001). This project expanded water coverage to unserved and low-income neighborhoods of Dakar and secondary cities. The third project—the Water and Sanitation Millennium Project (2010)—was designed to address three challenges that emerged during late 2000s: (i) sustainable groundwater management; (ii) weakening financial viability of SONES and National Sanitation Agency of Senegal (ONAS - Office National de l'Assainissement du Sénégal); and low water and sanitation coverage in rural areas. Although these projects were implemented as stand-alone projects, there was continuity in the project series as findings in the previous ones had led to the design and implementation of the following projects. Therefore, the project under this review is a continuation of the project series in water and sanitation sector, but as discussed in the previous paragraph, the project objectives are not sufficiently



challenging to reflect the World Bank's more than two-decade long engagement in Senegal and the water and sanitation sectors.

Overall, the relevance of the objectives is rated Substantial.

Rating

Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To improve access to water services in selected urban areas in a financially sustainable manner.

Rationale

Theory of Change for Objective 1

The project's inputs—IDA credits—were to be used to finance the construction of boreholes, booster pumping stations, ground and elevated water storage tanks, water collection and feeder pipes in Tassette and Mbour areas and the construction and/or rehabilitation of boreholes, one elevated storage tank, distribution pipes, standposts and household connections in Nguekhokh area. The project was also to finance the construction of water distribution pipes and social connections in the selected urban centers of Diourbel, Mavour and Richard Toll. The expected outputs of these activities were increased water production and transmission capacity in Tasette, Mbour and Nguekhokh areas, and increased number of standposts and household connections in Nguekhokh and other three selected urban centers. The outputs achieved in the Tasette and Mbour areas would have been expected to lead to the project outcome of addressing water shortages in Dakar-Petite Cote and Mbour. The outcomes expected from the outputs achieved in Nguekhokh and other three selected urban centers would have been improved water quality and increased access to water. The causal pathways from inputs to outcomes were valid and direct, and the outcomes achieved through physical investments could be attributed to the project's intervention. But the expected outcomes were closer to output level in the results chain, and the project's impacts on service delivery aspects—i.e., availability, reliability, quality, and affordability—and socio-economic welfare of the beneficiaries were not captured by the theory of change, such as improved health and the time saved because of the elimination of the requirement to fetch water that could be used for money earning activities.

The phrase "in a financially sustainable manner" in the project formulation was not defined. This review interprets this phrase as the "provision of water services in a cost-efficient way" that would ensure sufficient maintenance of the water service system resulting in sustained reliability and quality of water supply. The technical assistance activities defined in the third component, i.e., assistance to the government in formulating the next round of urban water and sanitation sector reforms and updating the performance contract for water services, were expected to result in the identification of next steps in the sector reform and lowering the risks related to the operation of the water services under the updated performance contract for



the private operator. Assuming that lowered contractual risks would lead to a lower fee demanded by the private operator, this would lower the water cost and improve the affordability of water while increasing the amount of money available for additional investments and sufficient maintenance of the water network. The causal pathways are somehow valid, but not so direct. The project design did not include activities that would directly lead to an improvement in the financial viability of the water utility, nor the sustainability of water services. The achievement of the expected outcome could be partly attributed to the project's intervention since technical capacity of the utility and/or the operator in maintaining the water system, and financial viability of the utility to continue with investments to ensure water availability to meet increasing demand, were not directly covered under the project. Although the project was to support the sector reform through tariff studies and the conclusion of the performance contract with a private operator, the financial viability of the utility dependent on the government's decision to raise the tariffs.

Overall, the project's ToC for Objective 1 was robust regarding the achievement of the project objective in improving access to water, but there were gaps as to how water services would be provided "in a financially efficient manner."

Outputs

- **Additional water production capacity constructed under the project.** The target was to construct 35,500 cubic meter of additional water production capacity. The achievement at 35,243 cubic meter was slightly lower than the target value.
- **Water storage capacity constructed under the project.** The achievement at 25,400 cubic meter was higher than the target of 24,600 cubic meter.
- **Length of feeder pipes constructed under the project.** The project financed the construction of 117 km of feeder pipes. The target was 99.50 km revised at the time of additional financing.
- **New piped household water connections that are resulting from the project intervention.** The achievement was 20,000 household connections as targeted.
- A consultancy firm hired under the project advised the government on the Second Generation (2G) sector reform, which included a water tariff study and support to the bidding process of a performance contract with a private operator. These activities were not captured by the results framework.
- A total of six piezometers and remote monitoring equipment were installed to strengthen groundwater monitoring and improve knowledge of groundwater resources of the Directorate of Water Resources Management and Planning (DGPRES - Direction de la Gestion et de la Planification des Ressources en Eau). These activities were not captured by the results framework.

Outcomes

- **Number of people in urban areas provided with access to improved water resources under the projection.** The target was to connect 180,000 people to piped water. It was verified that on average nine people would benefit from each household connection. The project financed 20,000 household connections; therefore, the total number of people benefiting from piped water was calculated at 180,000.
- **Number of people with access to enhanced water supply services under the project.** This indicator measures the cumulative number of people in urban areas currently having access to water services who received enhanced water from production facilities constructed under the project. It was calculated by dividing the product of additional water produced from project financed facilities (cubic meter per day) and network efficiency of 80 percent by the product of peak factor of 1.3 and 65 liter



per capita per day, which is average daily consumption per capita. In line with the additional water capacity constructed under the project, the number of people with access to enhanced water supply services increased by 562,000, slightly higher than the target of 560,000, which was revised up from 330,000 at the time of additional financing.

- **Beneficiaries that feel project investments reflected their needs (percentage).** A satisfaction survey was conducted at project closing. Around 90 percent of the participants responded that the project investments reflected their needs. A similar survey conducted during Mid-Term Review resulted in a satisfaction rate of 81.70 percent. The target was 80.0 percent. The survey assessed the impact of the project investments both in water supply and sanitation services, rather than assessing the beneficiaries' satisfaction with water services before and after project investments. Therefore, there was no baseline defined at appraisal.
- **Financial equilibrium of the urban water supply subsector.** The target of this indicator was defined as SONES having a cash balance equal or higher than zero (The definition of cash balance is "previous year's cash plus net cash flow operations minus debt service and variation of working capital requirements). According to SONES' financial reporting, the water utility maintained financial equilibrium through to project closing. The achievement of debt service coverage ratio above the target of 1.1 throughout project implementation is evidence of SONES' sustained financial equilibrium. In their email dated October 28, 2002, the project team reported that SONES used the financial model developed under a previous World Bank-financed project and the tariff study prepared under this project "to engage the discussions with the Government on the necessity to raise tariffs to improve the coverage debt ratio. This model was also used by SONES to negotiate the conditions of financing of future investments." The project team also maintained a policy dialogue with the government regarding tariff adjustments. As a result, tariffs were increased in 2015 and 2020 helping SONES and the sanitation utility ONAS maintain their financial equilibrium.

The project was highly successful in achieving the targets related to the construction of physical water production, transmission, and distribution networks. The project's intervention resulted in an improvement in access to water. However, the information is insufficient regarding whether the project addressed the water shortages in Dakar, Petite Cote and Mbour through the increase in water production capacity and the construction of the related storage and transmission network; there is no information in the ICR regarding the duration of water service availability per day in these urban areas. The information is also insufficient to assess the reliability, quality, and affordability of water service in the project areas; the indicators are inadequate to capture the project's impact on water service delivery aspects. On the other hand, the beneficiary satisfaction rate of 90 percent can be used as a proxy for the improvement in water services beyond having simple access to water.

Overall, the project's efficacy in achieving Objective 1 is rated Substantial.

Rating
Substantial

OBJECTIVE 2

Objective

To improve access to sanitation services in selected urban areas in a financially sustainable manner.



Rationale

Theory of Change for Objective 2

The project's inputs—IDA credits—were to be used to finance the construction of sanitation facilities in Joal-Fadiouth including extension of the sewerage network, construction of sewage pumping stations, and installation of household and social connections to the sewerage system in Joal-Fadiouth, Diourbel, Mbour, and Richard Tool. Additionally, the project was to finance the construction of a wastewater treatment plant and a sludge treatment plant, and installation of on-site household sanitation facilities in Joal-Fadiouth. The project's outputs of improved sewerage networks in these towns would result in more people having access to modern sanitation facilities. The PAD (p.23) states that Joal-Fadiouth was selected as a priority city for the establishment of a sewerage system because of severe sanitation and environmental problems in the city stemming from its location on the coast compounded by a high-water table and the population density. The establishment of a functioning sewerage system would have been expected to lead to the project outcomes of addressing those severe sanitation and environmental problems, but the PAD did not identify those problems, nor were they captured by the project's results framework. In general, the increase in access to modern sanitation facilities with adequate wastewater and sludge treatment capacities should lead to outcomes such as improvement in health and environment due to decrease in dumping of wastewater to the environment. Furthermore, establishment of on-site sanitation facilities should be expected to decrease open defecation and increase the security of especially women and girls. However, the outcome expected from project's intervention as formulated in the project objective, i.e., improved access to sanitation services, was closer to output level in the results chain, and the project's impact on socio-economic welfare of the beneficiaries was not captured by the theory of change, such as improved health, decreased open defecation, and increased security. Furthermore, the project's theory of change did not address the sustainability of sludge removal and treatment services. The PAD does not include any information on how sludge from on-site sanitation facilities would be removed and treated in the sludge treatment facility in Joal-Fadiouth and the sustainability of this process. Furthermore, like in the first objective, "in a financially sustainable manner" in the project formulation was not defined. This review interprets this phrase as the "provision of sanitation services in a cost-efficient way" that would ensure sufficient maintenance of the sewerage system resulting in sustained reliability of sanitation services. The project design did not include any activity that would directly lead to an improvement in the financial viability of the sewerage utility, nor the sustainability of sanitation services. The project financed the preparation of a tariff study but the government decides on the tariff levels. While an indicator was included in the results framework capturing the coverage of cash operating expenditures of sewerage activities of the utility, the achievement of this indicator could not be fully attributed to the project's activities. Overall, the project's theory of change for Objective 2 was sound regarding the achievement of the project objective in improving access to sanitation services, albeit the expected results being closer to the output level, but there were gaps as to how the project contributed to the provision of sanitation services "in a financially efficient manner."

Outputs

- **Length of sewers constructed under the project.** The project financed the construction of 100 km of sewers as targeted.
- **New household sewer connections constructed under the project.** The project financed the connection of 6,000 households to the sewerage network as targeted.
- **On-site sanitation facilities constructed under the project.** The project financed the construction of 320 on-site sanitation facilities as targeted.



Outcomes

- **People provided with access to "improved sanitation facilities" under the project.** It was verified that 13 people benefited from one sewerage connection. This number is higher than the number of people (9) benefitting from each water connection, because there are multiple water connections per housing unit while there is generally only one sanitation facility in the same unit. The achievement reported in the ICR was 83,694 people against the target of 80,000. As was the case for the indicator that measured the number of people with access to improved water, this indicator simply counts the total number of sewerage connections and on-site sanitation facilities in a different way; hence, this indicator is an output indicator rather than an outcome indicator.
- **Coverage of cash operating expenditures of sewerage activities of ONAS.** This indicator was defined as the ratio of ONAS' annual revenues from sewerage surcharges to its annual cash operating expenditures. This was included in the financing agreement as a covenant. Based on the financial reporting of ONAS, this ratio was 0.69 (or 69 percent) at appraisal. The target was to increase the ratio to 90 percent. The achievement at project closing in December 2021 was 96 percent. However, in September 2020, 15 months before project closing, this ratio was at 78 percent, and had a fluctuating pattern rather than a linear increase throughout project implementation. The significant jump in the ratio within the last year of project implementation was mostly due to the government's decision in August 2020 to increase the sanitation fees for public sector from US\$0.50 to US\$1.27. ONAS used the project-financed tariff study and financial model to negotiate with the government for a tariff increase. The World Bank's project team had a continuous policy dialogue with the government for tariff adjustments. These had contributed to the improvement in the financial viability of ONAS, but its sustainability depends on government's regular adjustment of tariffs.

The project was highly successful in increasing the number of people with access to improved sanitation services through the construction and expansion of sewerage network and construction of on-site household sanitation facilities. However, the evidence is insufficient what development outcomes were achieved as a result of these outputs such as improved health or reduction in open defecation. Additionally, the evidence is insufficient to assess whether the sanitation utility has financial and technical capacity to sustain sanitation services; ONAS' financial viability depends on the government's decision on adjusting tariffs and the utility's financial equilibrium had not been stable through to project closing. The project did not finance any activity to strengthen the technical capacity of the utility in O&M of the sanitation network nor the sustainability of sludge removal and treatment processes. But as was the case for Objective 1, the beneficiary satisfaction rate of 90 percent, which included both water and sanitation services, can be used as a proxy for the improvement in sanitation services.

Overall, the project's efficacy in achieving the project objective to improve access to sanitation services in selected urban areas in a financially sustainable manner is rated Substantial.

Rating
Substantial



OVERALL EFFICACY

Rationale

The project was highly successful in increasing access to both water and sanitation services. However, the theory of change for both objectives had gaps in how these services would be provided in financially manner. Additionally, the project's result framework did not capture the project's impact on service delivery aspects of availability, reliability, quality, and affordability. The project supported the sector reform through a tariff study and facilitating the preparation of tender documents for the performance contract to be signed with a private operator. These contributed to the government's decision to adjust tariffs to cost-recovery level and improved the financial viability of both utilities. Furthermore, the beneficiary surveys show that the satisfaction rate with water and sanitation services is 90 percent. In light of these achievements, the project's efficacy in achieving each project objective is rated Substantial; hence, overall efficacy is also rated Substantial.

Overall Efficacy Rating

Substantial

5. Efficiency

Economic Analysis

A "with project" and "without project" economic analysis was conducted at appraisal, which consisted of a cost-benefit analysis of the water supply component, and an assessment of the cost-effectiveness of the sanitation component (PAD, p.47). The assumptions used in the cost-benefit analysis were relevant. The consumer surplus was calculated as the multiplication of the increase in water consumption by the difference of water price before and after the project. The costs consisted of the investment costs of the water production and supply network that was to be built and/or rehabilitated under the project and the incremental operation and maintenance costs such as electricity consumption, chlorination, and 0.5 per cent of the investment cost for maintenance. However, the benefits stemming from the elimination of time spent for water fetching and reduction in health costs were not included in the cost-benefit analysis; therefore, the analysis was rather conservative. The economic internal rate of return (EIRR) calculated for the water component at appraisal was 14.4 percent, and the net present value (NPV) was US\$14.6 million at a discount rate of 10 percent for a 30-year period. A similar analysis was conducted at the time of the Additional Financing, which resulted in an EIRR of 15.2 percent and an NPV of US\$19.2 million.

For the sanitation related project investments, a cost-effectiveness analysis was conducted to compare alternative sanitation services, i.e., sewerage services and on-site sanitation (PAD, p.50). Because of the high-water table in most of Joal-Fadiouth that forbids infiltration and requires frequent emptying of traditional latrines, sewerage connection stood out as the most cost-effective solutions for households that were closer to the sea and on-site facilities for households located in areas with a lower water table. For sanitation investments in other selected urban towns, the per capita cost of a sewerage connection was calculated at US\$159 and that of an on-site sanitation at US\$141. The cost of a sewerage connection in Joal-Fadiouth was estimated at US\$232, but this was justified because of the technical design criteria and substantial savings in frequent pit emptying costs for the beneficiaries in that town.



At project closing, an economic analysis was conducted using a methodology similar to the that used at appraisal. In addition to the benefits identified at the time of appraisal, economic benefits associated with the time-avoided by women and girls for fetching water were included in the analysis. Costs were updated with actual project costs. The calculations resulted in an EIRR of 12.7 percent and an NPV of US\$8.47 million. The reasons for lower EIRR and NPV values, despite inclusion of the time-avoided for fetching water as a benefit, were higher actual costs of the Blaise Diagne International Airport (AIBD - Aéroport International Blaise Diagne)-Mbour feeder financed under the project and the higher cost of ALG3-AIBD pipeline financed by the African Development Bank. Additionally, the ICR (p.15) states that “the estimate of savings on works (54%) at the time of the Additional Financing was too optimistic.” Because of the inclusion of the time avoided for fetching water as a benefit, the post-project completion analysis was less conservative compared to the analysis at appraisal and additional financing. If this benefit, which is valued at the hourly minimum wage of 334 Senegal currency per hour were excluded, the EIRR would be lower.

For the sanitation investments, a cost-effectiveness analysis was conducted at project closing. The per capita investment cost of sewerage was US\$151, which was US\$9 cheaper than the estimate at appraisal. Additionally, the economic benefits of the sanitation investments were estimated at US\$6.7 per person per year for emptying pits, and US\$8 per person per year reduction in health costs—based on a rough estimate of the cost of diarrheal diseases. These economic benefits were not estimated at appraisal or at the time of additional financing. The ICR does not provide information about the per capita cost of sewerage investments in Joal-Fadiouth.

Financial Analysis

At appraisal, the financial impact of the project was estimated as the incremental revenue to be generated by the water supply. These incremental revenues consisted of water sales as a result of the increased water production and new water connections to be financed under the project. As in the economic analysis, the incremental costs consisted of the investment costs and the operation and maintenance costs of the water supply network. The assumptions used in the analysis were adequate to measure the financial impact of the project. The analysis resulted in a financial internal rate of return (FIRR) of 8.3 percent. At the time of additional financing, the FIRR was estimated at 11.4 percent because it was estimated that savings on works would be 54 percent. Using the same methodology, a financial analysis was conducted after project closing with actual numbers and the FIRR was estimated at 10.3 percent. The decrease in the FIRR is attributable to the increase in the project costs.

Operational and Administrative Efficiency

There was continuity in the project team; task team leaders were selected from within the project team. The credit commitment rate was maximized within the first year of project implementation. This was mostly because of the preparation of the technical, environmental, and social studies related to the project activities financed during preparation using the residual funds from the previous IDA-financed Water and Sanitation Millennium Program (PEPAM - Programme d'Eau Potable et d'Assainissement du Millénaire). Including the savings from the additional financing, all project funds were disbursed by project closing. The ICR does not report any issues with procurement or implementation of safeguard policies that had an adverse impact on project implementation. All project activities were completed on time. Project closing time extension of 18 months was necessary because of time required to complete the project activities to be financed by the additional financing. The restrictions imposed because of the onset of COVID-19 pandemic had a significant adverse impact on project



implementation after which disbursement slowed down. But a modified work program was implemented that resulted in the completion of project activities without delay.

Overall, the project's efficiency in achieving the project objectives is rated Substantial.

Efficiency Rating

Substantial

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

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	14.40	71.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	12.70	78.90 <input type="checkbox"/> Not Applicable

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

6. Outcome

While the project objective was output-oriented rather than outcome-oriented and not sufficiently challenging given the World Bank's long-term engagement in Senegal and the water and sanitation sectors, the project objectives were highly aligned with the World Bank strategy and the country context. The relevance of objectives is rated Substantial. The project's efficacy in achieving both project objectives is rated Substantial, so is the project's efficiency. Overall, the project's outcome is rated Satisfactory.

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

Financial viability of the utilities: SONES and ONAS revenues depend on the tariff level decided by the government. Two tariff increases during project implementation sustained SONES' financial equilibrium, but ONAS had difficulties in maintaining a financial equilibrium. If tariffs are not regularly revisited and adjusted, the utilities' financial viability might worsen resulting in insufficient maintenance of the water and sewerage networks. Furthermore, public institutions' non-payment of sanitation bills poses a risk to the financial viability of ONAS.

Availability of water: As a result of the boreholes constructed and the AGL3 connection established under the project, the risk of insufficient water production in the short and medium-terms is low. However, because



of continuously increasing water demand and adverse effects of climate change, water production may fall short of meeting demand in the long-term. To avoid such a situation, in addition to further investments in water production, water conservation measures should be implemented along with a revision of the existing tariff block structure which charges higher prices for higher water consumption amounts.

Technical capacity: Both SONES and ONAS have technical capacity to operate and maintain the water and sewerage networks, respectively. The 15-year performance contract with a private operator will improve SONES' supervision of the water supply network. Therefore, the technical risk to adequate maintenance of the water and sewerage networks is low. However, as explained in the first entry above, a worsening of the financial viability of the utilities may result in insufficient maintenance of these networks.

8. Assessment of Bank Performance

a. Quality-at-Entry

Addressing water shortages while increasing access to water and sanitation services was of high strategic relevance for Senegal to meet growing water demand in the Dakar region, to supply improved water to a higher number of people and decrease the significant gap between access to water and sanitation services outside of the Dakar region. The PAD (pp.9-10) lists four lessons learned but it is not clear how these lessons are reflected in the project design—accountability to build and maintain trust with customers, subsidizing access rather than subsidizing tariffs, attention to wastewater disposal because of increased access to water, and sharing of the lessons from the Brazilian experience on metropolitan and integrate urban management with the Senegalese authorities. The project had a simple and straightforward design, which mostly consisted of water and sewerage infrastructure investments and household and social connections. Technical, fiduciary, and safeguards aspects of the project were adequate. The Project Coordination Unit (PCU) was allowed to use residual funds from the IDA-financed PEPAM Project for the preparation of tender documents of the infrastructure investments to be implemented; hence, the project preparation was advanced when the loan became effective. This facilitated efficient use of project funds early in project implementation. The project replicated the implementation arrangements of previous IDA-financed projects in the sector—SONES implementing the water component, ONAS the sanitation component, and the overall coordination by PCU. SONES and ONAS were assessed to have sufficient project implementation capacity and experienced specialists in procurement, contract management, and financial management. However, the identification of risks and their mitigation measures was not adequate. The PAD did not include a Systematic Operations Risk Rating Tool in an Annex. Risks related to financial management and procurement were discussed under their relevant sections. The risk related to the ineffective adoption and implementation of the sector reform was identified as the residual risk. The technical assistance support to be given under the project and close political dialogue with the authorities were to mitigate this risk. The M&E system was adequate to capture the results of the infrastructure investments but had shortcomings in capturing the project's impact on service delivery aspects and socio-economic welfare of project beneficiaries. Furthermore, the project's focus on gender was superficial consisting of some general comments about the impact of improved access to water and sanitation services on women and girls' lives without any attempt to capture these impacts systematically under the project



Overall, the Quality at Entry is rated Satisfactory with minor shortcomings in addressing service delivery and gender aspects.

Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

Twelve implementation support missions were held until the onset of COVID-19 pandemic in March 2020 after which project implementation was supervised through phone calls and emails. Project task team leaders and other specialists were based in Senegal or Cote d'Ivoire. The presence of the project team in the region facilitated frequent contacts with the Senegalese counterparts even during the pandemic. The ICR (p.21) reports that Management Letters, Aide Memoirs, and Implementation Status and Results Reports were candid in reporting project's performance. The project team was proactive in processing an additional financing to address the emerging water shortages in the Petite Cote and Mbour areas that contributed to the achievement of the project objectives. In addition to the project's support to a tariff study and preparation of bidding documents for a performance contract, the project team maintained a close policy dialogue with the Senegalese authorities that resulted in the adjustment of the water and sanitation tariffs twice during project implementation and the conclusion of the performance contract with a private operator. The project team's supervision of fiduciary and safeguard aspects of the project was adequate. The project closed with all funds accounted for and without any outstanding safeguards issue. The project team's overall focus on the development impacts of the project—measured as increased access to water and sanitation service—was adequate, but there were shortcomings in the supervision of the project's impact on water and sanitation services delivery, i.e., availability, reliability, quality, and affordability, and the socio-economic welfare of the beneficiaries, such as improved health and time-saved because of the elimination of water fetching, regarding especially women and girls.

Overall, the quality of supervision is rated Satisfactory with minor shortcomings in the supervision of the project development impact on service delivery and socio-economic welfare of the beneficiaries.

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The theory of change documenting how the key activities and outputs would lead to the expected outcomes of improved access to water and sanitation services in selected urban areas was sound (PAD, pp.28). However, there were gaps in the theory of change about how the project would contribute to the



delivery of these services in a “financially sustainable manner.” The formulation of the project objective was simple but inadequate to capture the project’s development impact; the project objectives did not include any service delivery outcomes, such as reliability or quality of these services, nor was the sustainability of these services adequately defined. The project objective indicators were adequate to encompass the project’s achievement in improved access to water and sanitation services, but these indicators were all at the output level because of how the project objective was formulated. The results framework did not include any indicator measuring improvements in water and sanitation services delivery or other socio-economic outcomes expected from increased access to water and sanitation services. The indicators measuring the financial viability of the utilities were insufficient to capture whether the water and sanitation services would be delivered in a financially sustainable manner. Because of the simple design of the project, the intermediate results indicators were adequate to capture the project’s outputs in water and sanitation infrastructure investments; they were specific, measurable, achievable, relevant, and timebound. The data collection methods and analysis were appropriate for the investment activities. Since the project objective was to increase access to water and sanitation services, baselines were not relevant. M&E design and arrangements were sufficient; the utilities and the Project Coordination Unit (PCU) were responsible for data gathering from national databases and progress reports prepared by supervising engineers who were to be hired under the project.

b. M&E Implementation

The PCU, SONES, and ONAS were responsible for M&E. The indicators included in the results framework were sufficiently measured and regularly reported. The M&E data were reliable and good quality; they were collected from progress reports and national databases, and the project’s institutional stakeholders had access to M&E data through a web-based interface. M&E implementation benefited from a comprehensive data system developed under previous World Bank-financed projects; hence, M&E functions and process are highly likely to be sustained after project closing. In addition to data collection, beneficiary surveys were conducted at the time of the Mid-Term review and project closing. However, the M&E design was not revised to include indicators to capture the project’s impact on the quality, reliability, sustainability, and affordability of water and sanitation services or the socio-economic welfare of project beneficiaries. The shortcoming in the M&E design to capture the delivery of services in a financial sustainable manner was not addressed, either.

c. M&E Utilization

M&E findings were accessible through a web-based interface and communicated to project stakeholders through regular reports. An additional financing was approved based on the M&E findings related to the insufficient availability of water for Dakar and Petite Cote regions and the project was restructured to allow credit savings to drill more boreholes as M&E findings showed that number of negative holes was higher than expected. The M&E data were adequately used to provide evidence of the project’s results; however, they were closer to output level rather than outcome level. For example, the number of people with access to water, a project outcome, is simply a product of the number of household connections—a project output—and the estimated average number of people living in a household. Therefore, M&E data were mostly used to provide evidence for the project’s outputs, which was a result of the output-oriented formulation of the project objective.



Overall, the M&E system as designed and implemented was sufficient to assess the achievement of the project objectives to increase access to water and sanitation service but there were moderate shortcomings in assessing the delivery of these services in a financially sustainable manner.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

At appraisal, the project was classified as Category B under Environmental Assessment (OP/BP 4.01) and triggered Natural Habitats (OP/BP 4.04), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12) safeguard policies.

Environmental Assessment (OP/BP 4.01): The project was classified as Category B because of the project site specific moderate negative impacts of project activities. An Economic and Social management Framework (ESMF), and the Environmental Social Impact Assessment (ESIA) for the Joal-Fadiouth sanitation works were prepared, consulted and disclosed in Senegal in March 2015 and on the World Bank's InfoShop in April 2015. The ESMF was to be used a screening mechanism for the identification of other investment projects whose sites were not known at the time of appraisal. Upon the identification of those project sites during project implementation, ESIA's and Environmental and Social Management Plans were prepared for those sites. SONES and ONAS assigned specialists for the supervision of safeguard compliance. Excluding the project site of Tassette pumping station, all project sites had Contractor Environmental and Social management Plans, and Occupational Health and Safety plans. During project implementation on incident and two accidents were reported in 2020 that were addressed according to the plans in place. The ICR does not report any issues related to compliance with the environmental safeguard policy.

Natural Habitats (OP/BP 4.04): The PAD does not provide information why this safeguard policy was triggered. According to the Integrated Safeguard Data Sheet at Appraisal Stage, Report No: ISDSA12877, the outlet of the wastewater treatment plant in Joal-Fadiouth would pass through a marine protected area; therefore, this safeguard policy was triggered. The project activities would not result in a conversion or degradation of this natural habitat, and the treated wastewater discharge point would be beyond the marine protected area. The ICR does not report the implementation of this safeguard policy.

Physical Cultural Resources (OP/BP 4.11): The PAD does not provide information why this safeguard policy was triggered. According to the Integrated Safeguard Data Sheet at Appraisal Stage, Report No: ISDSA12877, the project interventions areas had been inhabited for centuries and it was possible to encounter underground artifacts during construction. Therefore, this safeguard policy was triggered, and a chance find procedure was included in the ESMF. The ICR does not report any such artifacts encountered during project implementation.



Involuntary Resettlement (OP/BP 4.12): This safeguard policy was triggered because of the potential requirement of land acquisition for water production and rights of way for the water distribution networks. A Resettlement Policy Framework was prepared and disclosed in Senegal and on the World Bank's InfoShop at the same time of the disclosure of the EMSF. Project specific Resettlement Action Plans were prepared during project implementation, but they were initially based on the requirements of the national legislation, which did not fully comply with the World Bank's safeguard requirements. Following an audit, necessary measures were taken to make the implementation of this fully compliant with the World Bank safeguard policy requirements, including the establishment of a grievance mechanism. The ICR does not report what those shortcomings were and how they were addressed. The Implementation Status and Results Report No:6 states that, as of June 2017, a Conciliation Commission of Mediation Committees had not been put in place in Tassette, and resettlement measures had been implemented. Additionally, ONAS was late in hiring a resettlement specialist. All these shortcomings in the implementation of this safeguard policy were addressed at the time of the project team's following supervision mission in November 2018.

b. Fiduciary Compliance

Financial Management

The project benefited from the financial management arrangements set up in the previous IDA-financed PEPAM Project. The project coordination unit (PCU) of PEPAM Project was responsible for the financial management of the project. The PCU's capacity was assessed to be sufficient for financial management. Since specific financial management activities were to be implemented by ONSA and SONES, the Project Implementation Manual was updated accordingly to take into account those activities. Project interim financial reports were submitted according to the schedule with occasional delays. The project team reported that the project's financial statements were audited by an independent auditor with unqualified opinion. However, the audit reports included recommendations to improve the internal control arrangements. With the support of the World Bank specialists, the internal control arrangements were improved before project closing. There were also significant delays in payments to the contractors, which was addressed through an action plan. The ICR does not report any issues of corruption or misuse of funds associated with the project. At the time of project evaluation, all IDA funds were accounted for.

Procurement

Procurement was implemented in accordance with the World Bank's procurement policies and procedures. Actual procurement and disbursement closely matched the procurement planning and disbursement estimated at the time of appraisal because of the advanced preparation of the technical, environmental, social and bidding documents of some investment activities. This allowed the start of bidding process during appraisal (ICR, p.18). The ICR does not report any issues with procurement.

c. Unintended impacts (Positive or Negative)

None.



d. Other

None.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Highly Satisfactory	Satisfactory	Because of insufficient evidence on improvements in availability, reliability, quality, and affordability of water and sanitation services and the sustainability of sanitation services.
Bank Performance	Highly Satisfactory	Satisfactory	Because of minor shortcomings in service delivery and gender aspects both at entry and during project implementation.
Quality of M&E	High	Substantial	Because of moderate shortcomings in capturing results of the technical assistance activities on delivery of water and sanitation services in a financially sustainable manner and the project's impact on service delivery aspects of availability, reliability, quality, and affordability.
Quality of ICR	---	Modest	

12. Lessons

This review has drawn two lessons based on the information in the ICR.

Close policy dialogue with the authorities can be critical in achieving project objectives. The project team were located in Senegal and Cote d'Ivoire. In addition to the 12 formal supervision missions, this proximity allowed frequent dialogue with the Senegalese authorities to solve issues related to project implementation and resulted in a productive dialogue about water and sanitation services sector reforms. As a result, the government adjusted tariffs twice during project implementation that had a direct impact on improving the financial viability of the utilities in the short and medium-terms and conclusion of a performance agreement with a private operator.

Without a robust results framework, outcomes in water and sanitation service delivery aspects cannot be adequately captured. The project's results framework was designed to capture



the increases in the number of water and sewerage connections. These indicators were sufficient to capture the results expected from the project's intervention as formulated in the project objectives. However, water and sanitation projects require a higher level of achievement that should encompass improvements in service delivery aspects, such as availability, reliability, quality, and affordability; especially so, in countries with low access rates like Senegal. The project's framework lacked these indicators. This can be extended to the coverage of project's impact on socio-economic welfare of the project beneficiaries, with a special focus on women and girls.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR provides a comprehensive view of the project. The evidence is appropriately referenced for the achievement of water and sewerage connections and increase in water production increase, but there are gaps in referencing evidence to the delivery of services in a financially sustainable manner. While the narrative about the project's performance was internally consistent, the analysis was restricted to the achievement of target values and the project's impact on service delivery aspects were ignored. Therefore, the ICR's narrative was more output focused rather than outcome. It was also more descriptive rather than evaluative. The parsing of the project objective was complex making it unclear with respect to how the project's achievements were assessed. The report was broadly in line with the Bank guidance. The sections on Quality at Entry, Safeguards, Fiduciary Compliance, and M&E Quality could have benefited from a much more detailed discussion in accordance with the Bank guidance. Entries in the Lessons and Recommendations section respond to the experiences gained during project implementation but they are more in the form of findings rather than lessons. Some sections of the report were unnecessarily long, such as the section on sector context.

Overall, the quality of the ICR is rated Modest.

a. Quality of ICR Rating

Modest

