Ex post evaluation – Senegal

Sector: Water, sanitation and waste water management - large systems (CRS code 14020)
Programme/Project: Water supply Dakar IV, long-term solution (1998 66 724)*
Implementing agency: Société Nationale des Eaux du Sénégal (SONES)

Ex post evaluation report: 2016

		(Planned)	(Actual)
Investment costs (total)	EUR million	89.4	139.3
Counterpart contribution	EUR million	12.5	17.0**
Financing	EUR million	66.7	122.3**
of which BMZ funds	EUR million	10.2	14.0***

* Programme in 2014 random sample
** Estimates (based on: World Bank Final Report and KfW project documentation owing to use of remaining funds)
*** Including remaining funds of EUR 3.8 million from Water Supply, River Cities and Regional Cities projec

Summary: The Water supply Dakar IV programme evaluated here is part of the World Bank's Urban water supply Dakar component. The programme's priority areas focused on securing an ecologically sustainable drinking water supply in the greater Dakar region. The programme was carried out jointly by six international and local financiers, with the World Bank taking on the leading role. Part of the collection and transportation capacity between Lake Guiers and Dakar was co-financed from German FC, specifically the construction and extension of the pressure boosting stations in Meckhé and Carmel that are needed to transport drinking water. The total costs of the Dakar water supply project totalled EUR 139.3 million; the FC contribution was EUR 14.0 million.

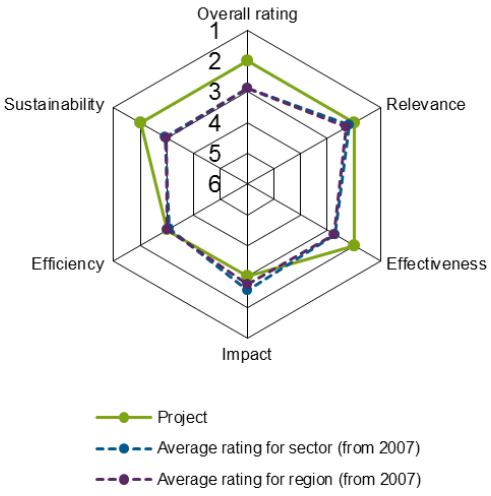
Objectives: The overarching goal of the project was to improve the health situation of the population in the programme area and protect underground water resources. The module objective was to ensure a sustainable and adequate water supply.

Target group: The target group was the population of the greater Dakar region, especially the population of the poorer peri-urban areas. All told, roughly 725,000 people benefited from the improved supply.

Overall rating: 2

Rationale: Overall, the programme managed to help improve the water supply of the population of Dakar substantially, and relieve the strain on the use of underground water resources. The positive health impacts of the project are impaired by the annual floods in the city since 2005. In light of the huge growth experienced by the city, ten years after commissioning, there are now water shortages again in the hot summer months. Both SONES and the donor community are working on overcoming this problem.

Highlights: Bundling to create very large packages of measures meant that significant cost savings were made with various lots owing to the favourable competitive situation. Moreover, the private operator has made it possible for its customers to pay bills via mobile phone.



Rating according to DAC criteria

Overall rating: 2

This FC project is part of the World Bank's Urban water supply Dakar component. This World Bank component is itself part of a larger World Bank project, the Long Term Water Sector Project; in addition to water services for Dakar, this project also included urban drinking water supply in secondary centres, central and local sewage disposal in Dakar and certain secondary centres, measures relating to water resource management and institutional capacity building for the affected institutions. However, this report will mainly consider the urban drinking water supply component in Dakar, and in particular the FC-financed lot of new construction and/or extensions to the Meckhé and Carmel pressure boosting stations, which are necessary components for the distribution of drinking water. For the non-FC-related portions, we refer the reader to the World Bank's Implementation completion and results report of 2009 and the Project performance assessment report of 2015.

Urban water supply services in Senegal are centrally organised; since the water sector reforms of the mid- to late 1990s, they consist of the state-owned asset holding company SONES and a privately managed operating company. The latter company is charged with operating water supply services under a recurring seven-year franchising contract, and is monitored by SONES through the performance indicators included in the contract.

Relevance

The core problems identified in the programme proposal were the insufficient development of water resources and the poor water supply situation in the per urban areas of Dakar in particular. Sewage disposal was also identified as a problem, and addressed through other components of the overarching Long Term Water Sector Project. From an ex-post perspective, the core issues were correctly identified.

At the time of the ex post evaluation, regular flooding in certain low-lying districts of Dakar also represents a significant problem. Since 2005, climate change and the increasing population density in Dakar (currently 4,000 people per km^2) have given rise to this problem, with thousands of houses being flooded at least once a year. There are a variety of reasons for this, ranging from disorganised urban development combined with settlement in flood areas, to inadequate waste disposal and cleaning of rain water drains.

Since the flooding problem was much less pronounced at the time of the programme appraisal than it is today, we find it justifiable that no measures were planned in this domain within the overall programme.

We consider the FC programme measures as a whole to be an appropriate way of contributing to the solution of the core problems. The results chain underlying the programme's design is a plausible one.

Improved water supply and waste water disposal services were and are an important priority of the Senegalese government. The project corresponds to the Federal Ministry for Economic Cooperation and Development's sector concept for water. The domain of water supply and sewage disposal is no longer a priority area in German-Senegalese cooperation efforts. The planned donor cooperation in the programme design was well designed.

Relevance rating: 2

Effectiveness

In the programme proposal, the target for completing the programme objectives was set for three years after the facilities started up operations, i.e. for 2009. Since not all the relevant data were available, we have also listed the values from 2013 (values available at ex post evaluation) for comparison. The achievement of the programme objectives defined during the programme appraisal can be summarised as follows:

Indicator	Initial value	Target value	Ex post evaluation
1. Total water production.	2000: 160,000 m^3/day	2009: 275,000 m^3/day 2013: 325,000 m^3/day	2009: 275,000 m^3/day 2013: 302,000 m^3/day ↳ **nearly achieved**
2. There is a reduction plan for the use of the existing wells[1] and it is complied with.	Not available	Plan exists	There is a reduction plan. However, the maximum output volume specified in the plan has not been achieved in any year so far. ↳ **not achieved**
3. Increase in number of people supplied in the greater Dakar region.	2000: 82%	2009: 87%	2009: 85% (somewhat lower due to incorrect population projections) ↳ **nearly achieved**
4. Water quality in water samples meets WHO standards.	no info	95% of water samples	2015: 99.6% (physico-chemical quality) 97.3% (bacteriological quality) ↳ **achieved**
5. Positive result after taxes (NEW) and positive cash flow at SONES.	Not achieved	Achieved	↳ **achieved**
6. NEW: The duration of supply is appropriate, and there are no more than 5 interruptions each year that last longer than 6 hours.	Rationing and frequent outages	24/7	**2009: achieved**

The programme objective indicators have largely been met. The expansion of the treatment facility allowed for a corresponding increase in production capacity. Ten years after the start of operation, however, the expanded capacity is no longer sufficient, and the past few years have seen the return of water shortages, especially in the extremely dry summer months.

[1] Due to the overuse of aquifers, it was agreed that the use of groundwater wells should be significantly reduced, and even stopped completely for certain wells. SONES and the government of Senegal have concluded a so-called well use reduction plan (official title: Schéma directeur de mobilisation des ressources en eau de Dakar et de la Petite Côte), valid until 2020, to cover well use in the entire water catchment area for Dakar.

Increased water use also led to an increase in sewage volumes. For this reason, extensive measures were also carried out with regard to sewage, including the construction of 10,000 wastewater connections in inner-city areas and about 70,000 septic tanks and a few condominial sewerage systems (small, inexpensive sewer systems with smaller pipe diameters at a shallower depth) in peri urban areas.

With regard to the protection of ground water resources, a well use reduction plan has been developed for public wells. This plan imposes a maximum output volume from underground water resources of 144,000 m^3 per day by 2020. However, this target volume has not been achieved in any year so far. In 2013, the output was still 149,000 m^3/day. Although the project was able to significantly reduce the pressure on underground water resources, it could not do so to the extent originally planned (cf. capacity utilisation in the Efficiency section).

Some 725,000 additional people were supplied with clean drinking water. This number is somewhat less than the 800,000 people projected in the project appraisal, and can be attributed to inaccuracies in the projection. We therefore consider this indicator as having been achieved. At 85%, the supply level in the greater Dakar region falls within the acceptable range. Water quality meets international standards in the majority of cases.

Due to the limitations in compliance with the well reduction plan, we assign an Effectiveness rating of satisfactory.

Effectiveness rating: 3

Efficiency

The per capita costs are most logically applied to the entire water supply component for Dakar, and amount to a reasonable EUR 192. However, more measures were carried out than originally planned, and (for instance) an additional expansion phase for the waterworks and additional measures in peri urban areas have already been financed.

In addition to programme implementation by SONES, the overarching Long Term Water Sector Project also made use of a coordination unit based at the Ministry of Water and Sanitation. The coordination unit was responsible for general project coordination between the government of Senegal, the different implementing agencies, and development partners. Specifically, their tasks included financial management, monitoring and evaluation. The coordination unit is not to be confused with the so-called implementation units, which generally replace government structures and which were rightly rejected by the 2005 Paris Declaration on Development Aid Effectiveness. Given the size of the overall project, the coordination unit in question seems to represent a reasonable approach.

SONES' efficient work made it possible to achieve significant cost savings. However, the process of coordinating the various donors also led to delays, so the implementation time came to 59 months rather than 47 months.

Overall, the production efficiency is still evaluated as good.

The state-owned asset holding company SONES and the private water supplier are both efficiently run companies. Ten years after starting up operation, however, the capacities of the facilities built for this project are now overtaxed. This can be attributed to the massive population growth in the greater Dakar region. At the time of the programme appraisal, there was no better alternative in light of the already heavy strain on ground water resources, and the fact that seawater desalinisation costs were still very high at the time. We classify the allocation efficiency, and therefore also efficiency as a whole, as good.

Efficiency rating: 2

Overall developmental impact

The overarching goal of the project was to improve the public health situation in the programme area through clean drinking water resources. An additional overarching goal of protecting underground water resources was also defined at time of the ex post evaluation.

No indicators were defined for the achievement of the health objective. This no longer conforms to the current state of the art. Possible indicators would include the number of water-borne diseases. Regrettably, no data was collected on this point by the primary development partner, the World Bank. However, given that it was also possible to finance house connections for poorer households through the financing of a large number of shared connections, and that supply times were improved from intermittent to 24 hours a day in 2009, it is highly plausible that the health objective was in fact reached.

As for the achievement of the goal of protecting underground water resources, it can be concluded from the achievement of the project objective indicator on well usage that although the use of underground water resources has decreased sharply, strong population growth has prevented it from decreasing to the desired extent.

The programme was explicitly for the benefit of poorer households. About 50,000 shared connections were built in the context of the programme. In addition, 70 new standpipes were constructed. The shared connections were made available to households for a deposit of EUR 30. The criterion for building these connections was geographic location, i.e. all households located in an area of the city classified as poor received a shared connection. In total, about 60% of the target group was supplied via shared connections. This figure alone indicates the project's high relevance with regard to poverty. A study of households' willingness to pay, performed in the context of the programme, also showed that households that belong to the poorest 20% of all households and that have a house connection spent 1.3% of their monthly income on drinking water, as opposed to 3% for households with no house connection. This is attributable to the relatively high fees charged in Senegal for the use of standpipes. For households both with and without a house connection, the portion of expenditure on drinking water still falls within an acceptable range.

Gender studies were also performed in the context of the project. These revealed that about 25% of households spent 30 minutes per day on fetching water if they do not have a house connection. This is relatively high for an urban area. As a result, significant time savings for women were achieved through the programme. We are therefore justified in claiming a significant reduction in the burden on women (and children), who are virtually always responsible for fetching water.

The overarching Long Term Water Sector Project also included extensive measures to prevent negative environmental impacts. These included the extensive sewerage component, for example, which covered the construction of sewer connections in inner-city areas as well as decentralised measures and the construction of so-called condominial systems in peri urban areas. In addition, an Environmental Management Plan was developed which also included social aspects, e.g. water supply to residents along Lake Guiers. Another important component was the establishment of a water management authority for Lake Guiers (Office du Lac de Guiers). The purpose of this authority is to coordinate the various water use interests for this freshwater resource. For example, the lake is an important bird sanctuary. Farmers also use lake water for irrigation purposes. However, the volumes of water extracted for agriculture and by SONES for water supply are relatively small overall. The birds are more directly threatened by other anthropogenic influences.

In the context of the sewage disposal component of the overall project, a Social Impact Study was performed after programme completion; it revealed that in 85% of the households that participated in the sewage disposal component, there has been an improvement in the cleanliness of the immediate environment, and no more stagnant waste water is observed in the streets. This, too, suggests that the project may have had a positive impact on health.

One risk for the achievement of the health objective are the floods that have been recurring regularly since 2005 after heavy rain events (cf. the Relevance section). These occur primarily in the lower-lying areas south of the inner city, and in the Niayes depression in the northern outlying zones of Pikine and Guediawaye. Among other effects, these floods cause the area's many septic tanks to overflow, so that rainwater mixes with human excrement. The floods often last for several days, and thousands of homes are usually affected. This limits the positive effects of the project.

Taking into consideration the sometimes limited health effects, the slight limitations on the achievement of underground water resource protection, and the strong positive involvement of the poorer segments of the population, we assign the overarching development policy effects an overall rating of satisfactory.

Overall developmental impact sub-rating: 3

Sustainability

The privately managed operating company does not disclose its financial situation. However, since the company has now extended its lease agreement for the third time, the operator's earnings position would appear to be satisfactory. As an asset holding company, SONES is also in a relatively good financial situation. The company has achieved positive after-tax results for years, i.e. it covers all its costs (data from 2011 to 2014). Since 2003, the company has also achieved a positive cash on hand status, i.e. its solvency as per the cash flow statement is ensured. Due to a long period with no water tariff increases (an increase in 2003 was not followed by another increase until 2015), cash flow dropped significantly at the end of 2014. After the recent tariff increase, however, the company's cash flow situation should improve again.

The situation with regard to underground water resources remains strained. For most aquifers, the volume of water being extracted is still greater than the recharge volume. This leads to a drop in the water table, and subsequently to increased ground water salinity. Although the project has contributed to a significant reduction in the use of ground water resources, new ground water resources have since been tapped for water supply to Dakar. Until the construction of a third treatment facility in Keur Momar Sarr has been completed, and/or until a desalination facility has been built, the pressure on ground water resources will therefore continue. Without a sustainable and integrated approach to water resource management, however, Senegal will not be able to resolve this situation completely, since agriculture is also part of the problem.

In light of the solid financial situation of the private company and of SONES, we assign a Sustainability rating of good.

Sustainability rating: 2

Notes on the methods used to evaluate project success (project rating)

Projects (and programmes) are evaluated on a six-point scale, the criteria being **relevance**, **effectiveness**, **efficiency** and **overarching developmental impact**. The ratings are also used to arrive at a **final assessment** of a project's development efficacy.
The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): the developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall (this is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") **and** the sustainability are rated at least "satisfactory" (level 3).