

Senegal: Water Supply in Six River Cities

Ex post evaluation report

OECD sector	14030 – Basic drinking water supply and basic sanitation	
BMZ project ID	1) 1993 65 305 (investment measure) 2) 1994 70 329 (complementary measure)	
Project-executing agency	Société Nationale des Eaux du Sénégal – implementing agency Société Sénégalaise des Eaux – operating agency	
Consultant	1) GPG (Groupement Preussner Grombach), Dakar 2) IGIP, Darmstadt	
Year of ex post evaluation	2007	
	Project appraisal (planned)	Ex post evaluation (actual)
Start of implementation	1) 4 th quarter 1994 2) 1 st quarter 1995	1) 1 st quarter 1996 2) 1 st quarter 2002
Period of implementation	1) 24 months 2) 24 months	1) 43 months 2) 52 months
Investment costs	1) EUR 16.6 million 2) EUR 0.3 million	1) EUR 15.1 million 2) EUR 0.3 million
Counterpart contribution	1) EUR 0.5 million 2) EUR 0.0 million	1) EUR 0.5 million 2) EUR 0.0 million
Financing, of which FC funds	1) EUR 16.1 million 2) EUR 0.3 million	1) EUR 14.6 million 2) EUR 0.3 million
Other institutions/donors involved	none	none
Performance (overall rating)	2	
• Significance/relevance	2	
• Effectiveness	2	
• Efficiency	1	
• Overriding developmental effects	2	
• Sustainability	1	

Brief description, overall objective and project objectives with indicators

The project comprised the rehabilitation and extension of the central water supply systems in Richard-Toll (including Rosso), Dagana, Podor, Matam, Bakel and Kédougou in order to sufficiently supply the population of these cities with drinking water. By covering drinking water needs, these measures aimed to help reduce water-induced diseases. As a complementary measure, the target group was to be encouraged to improve their hygiene practices. Overall objective of the project was a reduced incidence of water-induced diseases. The project objective was to supply the population of the project cities with drinking water all year round by means of central water systems. To determine whether the project objectives have been reached, the following indicators were defined:

- 1) The average consumption of drinking water has increased to over 40 litres per capita per day for house connections and to over 15 litres per capita per day for standpipes.
- 2) 96 % of all samples meet WHO water quality standards.
- 3) Technical losses in water distribution are reduced to less than 20 %.
- 4) Supply/connection rates increase to 80-100 % or 35-75 %, correspondingly.
- 5) Continuous supply is ensured for 18 hours per day (additional indicator defined for the purpose of ex post evaluation).

Project design / major deviations from the original project planning and their main causes

The project is designed as a private enterprise structure, consisting of the Société Nationale des Eaux du Sénégal (SONES), the national holding company, and the Société Sénégalaise des Eaux (SDE) as the private operating company. During the operating phase, SONES controls SDE's performance. SONES requires a relatively high number of staff for the controls, since the company mainly controls SDE's input, not its output.

As was set out in the project appraisal report, water treatment plants were built in the cities of Richard-Toll and Rosso, Dagana and Podor; in the other three cities (Matam, Bakel, and Kédougou) deep wells were drilled. Moreover, new water-towers were built, distribution networks rehabilitated and extended and material was supplied for the installation of additional standpipes and house connections. There were minor deviations from project planning in the number of water-towers, in the lines of distribution networks and in the capacity of the water treatment plants and the production wells. In addition to the FC measures, the holding company SONES has set up stronger pumps in the project cities of Matam and Bakel, because the original pumps in place had already reached their capacity limits. Due to the high iron content of the water in Matam, SONES established an iron-removal plant which was financed by the World Bank. The costs for the construction works and the equipment were approx. EUR 3 million lower

than estimated at the time of project appraisal, because increased competition resulted in lower prices.

The operating company SDE was to further extend the water network and to install new house connections. However, these tasks were not sufficiently completed because the cities have only limited commercial value for SDE. After the final inspection, remaining funds were therefore used to buy additional material for house connections, network extension and standpipes, in order to achieve the target level of connections.

With regard to the acceptance of the drinking water and the use of the river water, a campaign was to be carried out at the time of project appraisal (1994) to raise awareness among the target group for improved hygiene practices. These measures had not been implemented at the time of the final inspection (2000). Starting in 2002, the complementary measure carried out in connection with the project "Water Supply for Regional Cities" concentrated on the aspects consumption, social water connections and network extension as well as public standpipes. As a result, an exceptional authorisation to build multiple connections (social connections) was granted. Moreover, 500 additional house connections were installed, and more efficient and generally more familiar procedures to apply for a house connection have been introduced. The increase in multiple connections, which are intended to help mainly poorer households to pay their water bills, could not be achieved. 130 standpipe attendants were trained to operate the standpipes. The attendants are capable of properly managing the standpipes. However, price control at the standpipes does not yet function sufficiently well. The aspired increase in per capita water consumption could not be reached, but it has since become obvious that the targets were set too high at the time of project planning. Per capita consumption is within adequate limits (5-10 litres per capita per day where public standpipes are used and 30-40 litres per capita per day for customers with house connections). The fact that the originally intended measures to sensitise the public for improved hygiene practices were not carried out as planned hardly affected the project's success, since the users take the water from the project installations mainly for consumption purposes and the hygienically unsafe surface water for all other water needs.

As regards the utilisation of the installations the picture is mixed: while in Podor and Dagana only half of the installed water production capacities are used, the degree of utilisation in Richard-Toll is an acceptable 60 %. The installations in Kédougou can no longer render the projected performance due to an unexpectedly low aquifer yield. SONES is currently examining opportunities for a potential extension. In Matam and Bakel capacities were fully used, so that in these project locations capacities already had to be extended.

Key results of the impact analysis and performance rating

Overall, most of the project objectives were reached. It is only at the project site in Kédougou that the indicators supply/connection rates and continuity of supply have not been met. Given the connection rates of 75 % to 100 %, the target groups have generally been reached to a satisfying or acceptable degree (with the exception of Kédougou).

The project substantially contributes to decreasing water-induced diseases resulting from poor drinking water quality (overall objective). According to information from the health care centres, there has been a strong decline in diarrhoea, especially among children under 5 years of age, who are most likely to be affected by unsafe drinking water. The project also had a positive effect in reducing the incidence of schistosomiasis (bilharziosis), which was widely spread in Richard-Toll, for example. The health care centres confirm that schistosomiasis is much less common today than it was ten or fifteen years ago.

Due to better water supply, the project makes it easier for women to complete their household chores (cooking, dish-washing etc.), but overall the project had no potential to considerably promote gender equality. Even before the project, only little time was required to fetch water at the river or at existing shallow wells, so that the project had no substantial time-saving effect.

Almost 50 % of the target group are poor. Their living conditions could be improved substantially by means of the project, so that it directly helps to fight poverty.

Due to the low per-capita consumption rates, specific measures beyond the existing sanitation installations are not required to maintain hygienic conditions. Extracting drinking water for the purposes of the project only slightly affects the groundwater reservoir in the project locations of Bakel, Matam, and Kédougou. However, groundwater levels have fallen in Kédougou due to specific local conditions and climate changes, so that the wells' yield has suffered considerably. Sludges resulting as a consequence of river water treatment are properly dried and stored in suitable locations.

Considering the risks, the project's effects may be summarised as follows:

Significance/relevance: Sub-rating 2

The project was aimed at solving the problem of quantitatively and qualitatively insufficient water supply, which caused various water-induced diseases and is a core problem of development policy. The measures largely meet today's standards and requirements and correspond to the given framework conditions. Since the deep wells in the project location of Kédougou yield less water than expected due to falling groundwater levels, from an ex post perspective it would be more appropriate to process surface water instead of building a deep well in Kédougou under the given circumstances, i.e. scarce groundwater resources.

Effectiveness: Sub-rating 2

The (modified) project objective indicators with regard to average consumption at house or yard connections and with regard to water quality have been fully met, indicators with regard to connection and supply rates and with regard to continuous supply have been widely met (with the exception of Kédougou). Water consumption at public standpipes is below the projected target, but is acceptable since the water is used exclusively for drinking and cooking. The project design was suitable to contribute to a better water supply for the under-supplied target groups and basically corresponds to the needs and capacities of the operating company. A major strength of the project lay in the successful transfer to a private operator, which is crucial to guarantee that the project objectives are fulfilled. In this way, some disadvantages of public operators could be avoided, like the constant shortage of funds in the sector due to inefficiencies and the reluctance to raise fees. Maintenance services in the rural areas are since being entrusted to small private companies, proving that privatisation efforts in the urban water sector may even have structural effects.

Efficiency: Sub-rating 1

Technical losses could be reduced considerably and do not exceed 20 % in the project cities today. Collection efficiency is at an excellent 97 %. Capacity utilisation is satisfying in most locations. As was expected from previous experience, investment costs amounted to EUR 75 per capita on average (with the exception of Podor). Overall, the project's production efficiency can therefore be classified as good.

Our calculation of the static as well as of the dynamic generation costs resulted in complete full-cost recovery from a static perspective and partial full-cost recovery or very good coverage of operating overheads from a dynamic perspective. We therefore rate the allocation efficiency of the project as very good. Taking into account both criteria, we come to the conclusion that the project's efficiency is very good overall.

Overarching developmental impact: Sub-rating 2

The health hazards identified in the project region at the time of project appraisal could be reduced. The project has generally contributed to a structural change in water consumption patterns. Water for drinking and cooking is taken from the project installations, while river water is still used for doing the washing and to a lesser extent for personal hygiene. The measures were suitable to achieve the desired health effects, even if these could have been stronger still had the target groups been dissuaded from bathing in the river. The more far-reaching developmental effects were also slightly limited by the high costs for standpipe customers, who usually live on minimum incomes.

Sustainability: Sub-rating 1

The sustainability of the technical operating capability is guaranteed by the professional operating company SDE. The regional and central structures supporting the local structures and the controls on the part of SONES ensure constant quality. The sustainability of the yield of the deep well in Kédougou is strongly affected by the well's falling water level. Kédougou accounts for roughly 10 % of the total target group. Another minor risk for sustainability is that the government might once again raise prices only for the operators, not for consumers, which would lead to a deterioration of SONES' financial situation.

Considering all of the assessment criteria, we give the project "Water Supply in Six River Cities" and its complementary measure the rating 2 for its **high degree of developmental efficacy**.

General conclusions and recommendations

The comparatively unproblematic functioning of the private enterprise solution is due to a number of factors resulting partly from the country's and from the situation's specific circumstances. One of the most important aspects, however, was the fact that the situation in the water sector was relatively stable before being handed over to private structures. Moreover, the Senegalese government strongly supported the project's objective (ownership) and the pressure from among the population was high because of the poor supply situation in the capital Dakar. Last but not least the regular support of the donor community over decades has contributed to the good performance of the sector.

In water projects with involvement of the private sector, KfW should make sure that the fees and the salaries of the operating company and (if applicable) the holding company should be such that they give an incentive to connect quarters with low consumption levels (usually poor quarters).

Once the programme is finished, private operators will only be willing to invest in network extension and new house connections if they see some commercial value for themselves. It is therefore advisable to contractually agree on the further network extension and the connection of new customers, including corresponding sanctions in case of contract violation.

It has become evident that the operation of public standpipes is no longer economically viable if the clientele of the standpipe is too small because of a high rate of house connections in the area. This may induce the standpipe attendants concerned to increase water fees to an extent that the often poor population can no longer afford to buy it. As a consequence, demand for drinking water by this part of the target group decreases. Under such circumstances, both the consumers and the standpipe attendants should be protected. This may be done by means of feasible control structures on the part of the user groups on the one hand and by cross-

subsidising the low income of standpipe attendants with funds derived from house connections on the other hand.

The efficiency and effectiveness of superior control units (like SONES in the present project) may generally be improved if controls are not input-oriented, but instead focus on the processes and results.

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

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

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

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 an improvement is very unlikely. 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. A rating of 1 to 3 indicates a “successful” project while a rating of 4 to 6 indicates an “unsuccessful” project. In using (with a project-specific weighting) the five key factors to form a overall rating, it should be noted that a project can generally only be considered developmentally “successful” if the achievement of the project objective

("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are considered at least "satisfactory" (rating 3).