Reaching the Most Vulnerable: Scaling Up Service Delivery in Urban Water Supply and Sanitation

Executive Summary

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Introduction and Evaluation Purpose/Scope

This report synthesizes the key findings of evaluations of 15 Urban Water Supply and Sanitation (UWSS) projects, approved and implemented in 2001-2016 by the African Development Bank Group (AfDB, or “the Bank”).

This cluster evaluation aims to: (i) assess the relevance, effectiveness, efficiency and sustainability of UWSS projects; and (ii) draw lessons from what worked and what did not work.

This evaluation report is expected to inform the design and implementation of future UWSS projects under the Bank’s High 5s priorities related to improving the quality of life for the people of Africa.

The Bank approved 76 UWSS projects (amounting to UA 586 million in net loans and grants) in the period 2001-2009.

Fifteen UWSS projects, with a total net approval amount of UA 342 million, were purposively selected for this cluster evaluation. These projects are located in 12 Regional Member Countries (RMCs) as follows: one each in Cameroon, Republic of Congo, the Comoros, Ethiopia, Ghana, Kenya, Mauritania, Mauritius and Senegal; and two each in Morocco, Mozambique, and Tanzania.

Project Cluster Performance

Development Outcomes

Overall performance

The cluster of projects comprises four urban sanitation only projects, 10 UWSS projects, and one water supply only project. All the cluster projects were rated satisfactory on their development outcomes, with the exception of the Senegal and Mauritania projects.

The project cluster objectives were relevant, but there were weaknesses in some design aspects, such as risk assessments and the choice of technologies used.

The objectives of the project cluster were aligned with the water supply and sanitation demands and priorities of the 12 project countries.

The project cluster’s objectives aligned with the Bank’s priorities and strategies, which view water supply and sanitation as a crucial component of development.

As can be deduced from the extensive demand for water supply and sanitation, the projects were coherent.

National laws, regulations and tariffs ensured the inclusion of poor and vulnerable groups such that they could effectively access and benefit from water supply and sanitation projects through social tariffs, stand pipes and public latrines.
Project designs had some weaknesses, including (i) the lack of a holistic strategy to integrate all infrastructure activities into a single development package; and (ii) some risks were not adequately addressed including water tariff adjustments, the quality and reliability of water sources, the maintenance and sustainability of projects, the cost of energy, institutional capacity, private operators’ capacity, population and livestock growth, and the quality of existing distribution/collection networks.

In addition, some project designs were driven by predetermined technologies rather than technology choices to address needs and best value for money.

Significant Achievement of Objectives

There was a significant accomplishment of project water outputs, but uneven performance in improving access (outcomes) to sustained, quality UWSS services. All projects, except for those in Kenya and Senegal, accomplished their expected outputs. However, the evaluation found limited functionality of water infrastructure, as some of the water supply systems that were installed, rehabilitated or extended were not used optimally or had ceased to function. In addition, projects exhibited uneven performance in improving access to urban water, and limited integration of water projects with non-water related activities.

With regard to sanitation, although there were some success stories in wastewater management, sanitation in general remained a challenge for most project countries. For instance, in two of the 10 projects that included water and sanitation components, achievement of the sanitation components was missed completely, that is, in Tanzania MoWSS and Ethiopia. Three other projects (Kenya, Mozambique Niassa and the Comoros) only partially accomplished the required sanitation components.

The cluster projects were economically viable. Nevertheless, they experienced substantial implementation delays.

Based on the Economic Internal Rate of Return (EIRR), the projects were found to be viable economically. Data constraints limited the evaluation of the projects’ Financial Internal Rate of Return (FIRR). However, from the perspective of the public utilities, the projects’ financial viability was unsatisfactory, mainly due to low revenue generation, high investment and operating costs.

The cluster projects did not follow their implementation timetables nor their initial cost plans. Project loans took 35 to 103 months to fully disburse, with an average of 66 months, compared to a target of 49 months. Eight projects experienced cost underruns of 3 to 19 percent, mainly attributable to project downscaling. Implementation delays were mostly due to slow loan ratification for instance in Kenya, Mozambique and Senegal; procurement procedure issues; poor quality at entry; delays in the preparation of tender documents after loan approval (the Comoros); poor performance of contractors (Kenya); or slow payment of government counterpart funds for instance in Kenya, Mauritania and Tanzania.

Satisfactory Sustainability of UWSS Project Benefits

All projects’ benefits, except for Mauritania, Senegal and the Comoros, were found to be sustainable. Financial viability was the weakest sustainability sub-criterion.

The projects displayed viable technical soundness; realistic capacity for institutional sustainability; efficient political support and a positive government environment; effective ownership and partnership sustainability; satisfactory environmental and social sustainability; and resilience to external factors.
The projects experienced weak financial viability due to the poor performance of UWSS utilities, a risk that was not mitigated. Recurrent challenges related to (i) inadequate staff, human resources capacity and logistics; (ii) a high level of non-revenue water and (iii) incomplete metering installations. Other challenges included (i) high operating costs; (ii) poor coordination; (iii) mismanagement of resources; (iv) the lack of cost-sharing arrangements; and (v) failure to collect debts.

Project M&E Performance

Limited Monitoring and Evaluation (M&E) systems

Four of the projects did not incorporate M&E into their initial designs, that is, in Mauritius, Tanzania DWSS and MoWSS, and Kenya. In the other projects, the planned M&E systems were not operationalized or used effectively.

The Objectively Verifiable Indicators (OVI) of key project outcomes were reported adequately. However, three of the projects (Ethiopia, Mozambique Institutional and Mauritania) did not generate sufficient data for their performance indicators to be assessed, while four other projects (Morocco 8, Senegal, Mauritania and Tanzania DWSS) provided incomplete baseline data. In other cases, the reliability of some of the M&E data left much to be desired, with specific operational data unavailable for most of the projects.

Key Issues and Lessons

Quality of feasibility studies

Lesson 1: Project design requires a sound preparatory phase, with adequate and updated feasibility studies, for successful subsequent implementation.

Inconsistent quality of project design was a challenge that led to partial implementation of project outputs and limited spatial coverage. Each project in the cluster grew out of technical/engineering and feasibility studies. However, the poor quality or the outdated nature of some feasibility studies, such as those of Kenya Nyahururu and Ethiopia, created inconsistencies, which necessitated subsequent modifications to project engineering designs. These extensive modifications to project scope due to design errors and exogenous factors resulted in the use of sub-optimal solutions that adversely affected project efficiency and their physical targets.

Modifications increased the costs of water supply, which consequently limited implementation of the sanitation components for wastewater and solid waste management. The feasibility studies also became obsolete due to the prolonged time lag between the prefeasibility stage and the effective dates of projects.

Risk analyses were not updated during the project cycle and the following risks were not adequately addressed: (i) reliability of supply and quality of project inputs; (ii) access to reliable power to run pumps and treatment equipment; (iii) lack of appropriate and effective cost-sharing mechanisms; and (iv) weak commercialization of services and their by-products. In addition, high levels of non-revenue water and free dumping had negative impact on the financial capacity of the associated agencies.

Integrated urban water cycle and sanitation value approach strategy

Lesson 2: UWSS projects need an integrated water cycle and sanitation value-chain approach if they are to maximize water supply results and resolve sanitation issues.
An appropriate balance is required between investing in water, sanitation, hygiene and capacity development components to enhance achievement of the desired results from urban water interventions. The limited achievement of project outcomes in urban water development was partly due to the failure to integrate water production with distribution, as was the case in Mauritania, Tanzania Monduli, and Kenya, and with sanitation as was the case in Ethiopia and Mauritania.

Moreover, urban sanitation requires an integrated approach through its three main pillars, namely (i) wastewater collection and treatment; (ii) fecal sludge management (compost, biogas and electricity); and (iii) commercialization. This value-chain approach remained limited in many of the Bank’s projects such as in Mauritius, Senegal and Morocco Ninth, even if some good practices, albeit limited, emerged from some projects such as in Mauritius and Senegal. The re-use of treated effluent for irrigation purposes in Mauritius improved the overall water balance in a project area where there was a shortage of irrigation water.

Use of “state-of-the-art” technologies in UWSS

The urban sanitation project cluster used state-of-the-art technologies such as activated sludge process, aerated lagoons and waste stabilization ponds. Intensive treatment technologies used for urban sanitation, such as activated sludge process with biological nutrient removal and tertiary treatment with rapid gravity sand filters and UV disinfection, were found to be appropriate for Mauritius, while lagoon-based treatment plants were found to be appropriate for Morocco.

However, some of the selected technologies proved to be ill-suited to local conditions, such as in Senegal and Congo. In Dakar, Senegal, where land availability is an issue, the appropriateness of using an activated sludge process was questionable as it did not fit well with the local context. It presented risks to the power supply, costs of operation, and variations in effluent loadings. In Congo, although the choice of technology was appropriate, the system failed to function effectively due to lack of sufficient capacity to operate and maintain the plant. Consequently, the discharge of excreta into the environment was still common practice.

Regarding water supply, some RMCs, such as the Comoros, experienced difficulties in operating the built water system. In addition, the availability of spare parts and subsequent required expertise was challenging for a number of water systems, such as in Ethiopia, Mozambique, Senegal and Mauritania.

Sustaining UWS project benefits

**Lesson 3:** The use of “state-of-the-art” technologies in UWS is only relevant if they meet needed technology requirements and there is adequate availability of spare parts and relevant expertise.

**Lesson 4:** Since UWS projects can be undermined by utilities’ poor performance (technical, financial and commercial), addressing utilities’ shortcomings is a necessary prerequisite to sustain the project benefits.

The main challenge that was found to compromise the sustainability of the benefits of UWS projects relates to inadequate and unaddressed performance of utilities. Poor performance of utilities was evident in (i) high levels of non-revenue water; (ii) inadequate staff, human-resources capacity and logistics; and (iii) unreliable services.

Utility performance in the project cluster was generally poor, with a large gap in water service coverage and relatively high non-revenue water losses, mainly in the larger utilities as was the case in Mauritania and Tanzania. In addition, 54 percent of the water providers failed to cover
their operating costs. The inadequacy of tariff revenues was a concern in some projects such as in Tanzania, Senegal, Mozambique and Kenya, and sometimes required huge subsidies such as in Senegal and Kenya, due to non-compliance with tariff adjustment schedules. Lastly, only two of the 13 utilities reviewed claimed to provide water 24 hours a day, while only four of the 15 projects provided wastewater collection and treatment including Congo, Morocco, Senegal and Mauritius.

Reducing negative environmental impacts

Lesson 5: UWSS projects that include wastewater, sludge and solid treatment plant components need systematic mainstreaming of in-depth environmental and social impact assessments to reduce the negative environmental impacts.

The systematic mainstreaming of Environmental and Social Impact Assessments (ESIAs) in sanitation projects, particularly those related to wastewater treatment plants, is more important than an inefficient environmental categorization strategy. The Bank did not integrate critical environmental and social requirements at the appraisal phase, which would normally be recommended for such projects.

Inappropriate environmental categorization of projects with wastewater, sludge and solid treatment plants in Ethiopia, Senegal, Congo, Morocco, Mauritania, Mozambique Niassa and Tanzania MoWSS, led to insufficient environmental assessment, which resulted into negative environmental impact. Despite the availability of national environmental plans, laws and policies, the cluster projects except Mauritius and Morocco, did not dispose effluent in accordance with the requisite standards.

Lesson 6: UWSS projects need to address service delivery and behavioral change issues if they are to maximize the impact of the built infrastructure.

Due to insufficient or lack of fecal sludge and wastewater treatment in Congo, Ghana, Senegal and Mauritania, project countries continued to dispose raw fecal sludge and untreated wastewater generated from urban communities into the natural environment, leading to significant negative environmental impact.

Fostering the achievement of outcomes in UWSS projects

The success of the Bank’s UWSS interventions is measured more in terms of the number of people who gained access to water (compared with the target) than the systematic quality of services and the contribution to development objectives. This led to sub-optimal investments, inadequate focus on the beneficiaries, and a lower prioritization of self-monitoring.

Limited revenue collection and human resource capacity of water providers adversely affected the financial health of the utilities as well as the reliability of their service delivery.

Finally, some planned outcomes required profound behavioral change among stakeholders, especially the beneficiaries. This failed to occur in the cluster projects. Despite awareness campaigns undertaken by the projects, much still needs to be done in terms of raising awareness and changing behavior related to (i) hand-washing with soap (Mozambique); (ii) improved water storage conditions (Mozambique); and (iii) observing good hygiene practices (Congo, the Comoros and Cameroon). Behavioral change is a long-term process, which cannot be achieved within the context of the limited actions of the cluster projects.
About this Evaluation

This report summarizes the results of a cluster evaluation of 15 AfDB-funded Urban Water Supply and Sanitation (UWSS) projects that were implemented in 12 regional member countries in 2001-2016. The evaluation assessed the performance of the selected projects and drew lessons for the design and implementation of future UWSS projects in line with the Bank’s High 5s priorities related to improving the quality of life for the people of Africa.

The evaluation examined the relevance, effectiveness, efficiency and sustainability of the projects, the extent to which the intended project results were achieved, and the factors that facilitated or limited their achievement.

Lessons on what worked and what did not work for the UWSS cluster projects were distilled from multiple sources of evidence using both quantitative and qualitative data collection approaches including desk reviews of relevant Bank documents and literature; interviews with key internal and external stakeholders; and field visits of purposively selected project sites. Each category of data was analyzed using mainly descriptive statistics. Comparative analysis was also conducted.

Critical lessons from this evaluation include the importance of a sound preparatory phase backed by up-to-date feasibility studies for successful implementation; the relevance of “state-of-the-art” technologies, provided there is a match between project requirements, availability of adequate spare parts and relevant expertise; and the need to systematically address issues related to service delivery and behavioral change to maximize the impact of the UWSS infrastructure.