

Ex post evaluation – Zambia

>>>

Sector: Water supply and sanitation – large systems (CRS code 14020)
Programme: Urban Water and Sanitation Programme, Eastern Province, phase II (BMZ no.: 2008 66 798*)
Implementing agencies: execution: Ministry of Local Government and Housing (MoLGH), operation: Eastern Water and Sanitation Company (EWSC)



Ex post evaluation report: 2019

		(Planned)	(Actual)
Investment costs (total)	EUR million	4.40	4.77
Counterpart contribution	EUR million	0.40	0.77
Funding	EUR million	4.00	4.00
of which BMZ budget funds	EUR million	4.00	4.00

*) Random sample 2017. Another component of this project is the Devolution Trust Fund (phase 3), which will be the subject of a separate report.

Summary: The project included the maintenance, modernisation and expansion of the existing water supply systems (and, to a lesser extent, sanitation) in all of Eastern Province’s district capitals and its provincial capital. The period under evaluation, phase II, involved measures in Nyimba, Chadiza and Chipata. Only emergency measures were planned for Chipata during the appraisal, in part because infrastructure had been financed in the city during an earlier project. The operating agency, the ESWC, was founded on the advice of Financial Cooperation (FC) during phase I.

Development objectives: The FC programme aimed to alleviate health risks from waterborne diseases while ensuring dignified and humane living conditions by providing a sufficient supply of water and sanitation to the target group (impact). This was to be achieved by appropriately guaranteeing a supply of water and basic sanitation to the vast majority of the small-town population, as well as retailers, commercial businesses and public institutions in the programme locations in Eastern Province (outcome).

Target group: The primarily poor population living in small, peri-urban communities that form part of the programme towns and cities (around 20,000 residents during phase II at the time of the evaluation). Women and children in particular were intended to benefit from the improved supply.

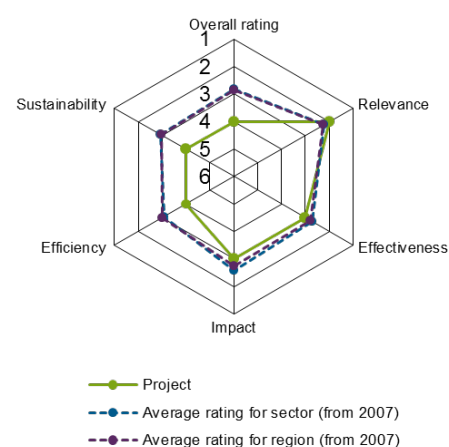
Overall rating: 4

Rationale:

Although important project objectives were achieved, the continuing high levels of unaccounted for water (UfW) compromise the effectiveness of the efforts. The operator’s business is not efficient enough to ensure sustainable operation. From today’s perspective, sustainable operation would be possible under the current prevailing circumstances, but is prevented by political influence on the operator.

Highlights:

In terms of negatives, we must highlight the persistently high levels of UfW in the two rehabilitated and expanded water supply systems, whose water distribution systems are gravity-fed. No measures were taken to reduce non-technical UfW, a result of political influence being brought to bear.



Rating according to DAC criteria

Overall rating: 4

Ratings:

Relevance	2
Effectiveness	3
Efficiency	4
Impact	3
Sustainability	4

Relevance

The programme aimed to alleviate health risks from waterborne diseases while ensuring dignified and humane living conditions by providing a sufficient supply of water and sanitation to the target group (impact). This was to be achieved by appropriately guaranteeing a supply of water and basic sanitation to the vast majority of small-town households, as well as retailers, commercial businesses and public institutions in the programme locations in Eastern Province; specifically, Nyimba and Chadiza during phase II (outcome). Both at the time and from today's perspective, the project correctly identified one of the key problems in Zambia's Eastern Province: the insufficient water supply available to the population in the rapidly growing district capitals and urban peripheral areas.

At the time of the programme appraisal in 2009, Zambia had one of the highest degrees of urbanisation in Sub-Saharan Africa (45% as per PP; 37% according to latest statistics for 2009). Around 85% of the urban population lived in urban peripheral areas. As a result of the high population growth (2.1% per annum) and constant rural-to-urban emigration, the supply of water and basic sanitation could not be expanded in line with the increasing resident numbers. Across Zambia, only 70% of the urban population had safe access to drinking water in 2009. Between 2012 and 2017, this figure stalled at around 83%, before increasingly slightly to 86% in 2018. Among the urban population, only around 29% had access to improved basic sanitation facilities in 2009, with the number now estimated to have risen to 64%. The population with no guaranteed access to affordable drinking water and basic sanitation facilities with acceptable hygiene levels uses unimproved water sources or contaminated surface water. The spread of waterborne diseases can be encouraged by the low connection rate, along with substandard levels of hygiene awareness around water use and the disposal of sewage, faeces and solid waste.

The measures implemented as part of the project were fundamentally a suitable means of helping to reduce health hazards resulting from the population's poor supply situation. By improving the water supply, the aim was to curb the use of unsafe water sources and, by extension, decrease the prevalence of waterborne diseases. From today's perspective, the impact chain set out in the programme appraisal makes sense, as the water supply available to the population in the programme locations has replaced the traditional, unhygienic water sources and the public's contact with contaminated water has decreased. The project is highly relevant in terms of water supply. Sewage was not a priority for the project, with only smaller pilot measures implemented. Due to the low population density, the small scale of the sewage measures did not lead to any adverse effects on public health.

The project was part of the German-Zambian water sector programme and made up the second phase of the multi-stage effort to improve urban water supply and sanitation in Zambia's Eastern Province. It was in line with the priority area strategy paper for the Zambian water sector (2010–2015). The aim of the water sector programme in urban areas is to improve the supply of water and sanitation services. During the second phase, there were no other donors working on activities directly or indirectly related to the FC module in the programme locations, meaning it was not possible to benefit from synergies with other donors' programmes.

Relevance rating: 2

Effectiveness

The programme objective set was to appropriately guarantee a supply of water and basic sanitation to the vast majority of the small-town population, as well as retailers, commercial businesses and public institutions in the programme locations in Eastern Province. The achievement of the objective at outcome level (and, implicitly, attainment of the development objective) was measured using the following indicators:

Indicator*	Status PA, target PA	Ex post evaluation
(1) Availability of water in each programme location under normal operating conditions	PA: few hours Target: at least 18 hours per day in the two programme locations	Nyimba: 19 hours – achieved Chadiza: 24 hours – achieved
(2) Total unaccounted for water as a percentage of water production in the distribution network in each programme location	PA: >50% Target: <30%	Nyimba: 40% – not achieved Chadiza: 40% – not achieved
(3) Consumption points equipped with water meters	PP: 0% Target: 100%	Nyimba: 91% – largely achieved Chadiza: 91% – largely achieved
(4) Population in the supply area within the programme locations who obtain their drinking water from the public supply network.	PA: <30% Target: 80%	Nyimba: 82% – achieved Chadiza: 92% – achieved
(5) Minimum per person drinking water consumption in the catchment area of the programme-financed water kiosks	PA: no data Target: 5 litres per person per day	Nyimba: 10 litres per person per day – achieved Chadiza: 7 litres per person per day – achieved
(6) The water quality is compliant with the national standard.	PA: non-compliant Target: compliant	Nyimba: 93% – largely achieved Chadiza: 97% – largely achieved
(7) Collection rate (fee collections as a percentage of water billed)	PA: 35–58% Target: 85%	EWSC: 92% – achieved
(8) Cost recovery ratio (running costs, including appropriate maintenance and small replacement investments, as a percentage of actual fee revenue)	PA: 30–60% (not including appropriate maintenance and replacement investments) Target: 100%	EWSC: 75.5% – not achieved

*) Target is classified as achieved if the indicators are met in the third year of operation (all indicators).

**) Exclusively used as drinking water.

Thanks to the measures promoted, the households in Nyimba connected to the water distribution network had 19-hour-a-day access to a safe water supply, while those in Chadiza enjoyed 24-hour-a-day access. However, the limited capacity of the elevated reservoir in Nyimba poses a risk to supply reliability, as not enough water can be stored as a back-up reserve under the current operating model (1.5 times the average daily demand required). In Chadiza, the raw water is extracted from the reservoir via two pumps, of which one was out of service during the site visit. The EWSC had attempted to repair the pump, although shutting down the second pump would have resulted in the network-connected water supply to Chadiza being completely cut off. The EWSC is considering procuring a mobile auxiliary pump as a replacement, which could be used at different locations if required.

Technical and administrative UfW accounts for around 40% of the total during the third year of operation in Nyimba and Chadiza, according to official figures, with the statistics initially released by the EWSC showing even higher losses. From the EWSC's point of view, these high levels of UfW are associated with substantial lost revenue and increased operating costs. It was not possible to conduct a clear causal analysis of the high UfW levels as part of the ex post evaluation. The water distribution network was only a few years old after the FC measures were completed and was in good technical condition. In view of this situation, the main cause of the high UfW levels is presumed to be defective water meters, substantial non-technical UfW such as illegal connections, incorrect meter readings or billing errors. As a result of political influence brought to bear by the Water Ministry in Lusaka, the EWSC did not have a supervisory board as of late 2018. This meant that no measures were undertaken to investigate the causes and take corrective action.

The EWSC states that 100% of connected water consumers have a water meter, a figure which is reflected in the official statistics from the National Water Supply and Sanitation Council (NWASC). Yet upon closer evaluation of the data that has been released, the corresponding figure for the two district capitals is only around 91%. One (as yet unproven) explanation for this is that new consumers connected to the water distribution network after the project ended experienced a delay before receiving their water meters.

In the programme towns of Nyimba and Chadiza, the aim was for 9,000 members of the predominantly poor, small-town population to have access in 2015. Since population growth was higher than expected, the population of the two towns was 20,586 in 2017. Despite the population more than doubling since the programme appraisal was conducted, 82% of urban residents in Nyimba and 92% in Chadiza living in the supply area obtained their water from the public network via service connections or from water kiosks.

The water samples taken by the EWSC at the water treatment plants demonstrate that the national limits, which are based on the WHO limits, were largely complied with (more than 93% compliance). There are no water quality test results available from consumer households within the two district capitals.

The EWSC's collection rate is 92%. This figure is provided by the regulatory agency, the National Water Supply and Sanitation Council (NWASCO).

In 2017, the EWSC fell short of the target for operating cost recovery (100%), achieving only 71%. By 2018, this figure stood at 75.5%. In terms of costs, the very high staffing expenditures are a contributing factor. Although not all vacancies have been filled, the EWSC has plans to create additional jobs, meaning that a trend towards even higher staffing costs can be expected. The operating expenses in the two district capitals were appropriate, with the systems maintained sufficiently. Reducing the high UfW levels in the system would help to increase operating cost recovery. The sanitation measures only made up 3% of the total FC-financed costs. The sewage systems repaired are mainly treatment ponds used to treat the sewage from two schools. They are fully functional and used as intended, although they are far too large for the current wasteload. The EWSC carries out minor maintenance work once a year (cutting back the vegetation around the ponds). These costs are not separately itemised in the EWSC's financial reports. In the two district capitals, the EWSC does not generate any revenue from sanitation services. However, the EWSC and other operators do not provide any sanitation services to the population supplied with drinking water either. Sewage is disposed of via local systems (latrines, etc.). Only a small amount of sludge accumulates from the local systems and treatment ponds.

Effectiveness rating: 3

Efficiency

Among the residents supplied via the water distribution network and kiosks, the average specific per capita investment cost in the two district capitals (Nyimba and Chadiza) is around EUR 260 (2017). When compared with the per capita costs of similar water supply systems, this figure could either be considered in the upper mid-range or disproportionately high. However, this can still be rated as appropriate given that it is an inevitable consequence of the dispersed settlement structure, the network lengths required by this sparseness and the poor road connections in Chadiza.

Project implementation was heavily delayed, lasting 85 months rather than the 60 assumed in the programme appraisal. The main reasons for this were delays in the award of contracts for construction work and its subsequent implementation. Construction activities were collectively put out to tender for programme phases II and III.

Due to the insufficient sewage volume and wasteload, the FC-financed sewage lines and treatment ponds were not efficiently utilised, as only one school was connected to each location. Some of the toilets financed continue to be operational, while others are out of service.

Although the EWSC is the owner and operator of the infrastructure promoted, the Ministry of Local Government and Housing (MLGH) was the programme executing agency, as the EWSC still did not have the required implementation capacity shortly after it was set up in 2009. The gap between the now-built water supply systems initially designed in 2007 and ultimately put into operation in 2016 was significantly lengthier than had been assumed during the programme appraisal. Before implementation, the design was not reviewed or updated for the two district capitals of Nyimba and Chadiza. Coupled with the stronger-than-expected population growth, this led to parts of the water supply system in Nyimba already reaching full capacity shortly after they were put into operation. Instead of the two that had been planned, three well pumps now supply water from the well field to the reservoir through the transfer pipeline. In terms of capacity, however, the transfer pipeline is only dimensioned for the delivery rate of two pumps. Another constraint in Nyimba is the storage capacity of the (elevated) reservoir, which is not actually used for storage due to the high demand. These capacity limitations have meant that the well field's output cannot be utilised to its full potential, that there is insufficient storage capacity to ensure a safe water supply (1.5 times the average daily demand), and that opportunities to supply additional households are limited. This has a negative impact on the project's efficiency in Nyimba. Overall, we rate the production efficiency as inadequate. The improved water supply is met with great approval by the 18,000 people supplied in the two district capitals, which at least indicates positive allocation efficiency.

Efficiency rating: 4

Impact

During the appraisal, no indicators were defined to measure development objective achievement (impact). The assumption that there would be positive health impacts from the continuous supply of clean drinking water, accompanied by hygiene measures, fundamentally rests on sound logic (e.g. by bringing about a reduction in diarrhoeal diseases among toddlers).

In the two district capitals, almost 18,000 people are supplied with water, with around 5,400 of these residents using water kiosks. Households not hooked up to a service connection and instead obtaining their water from kiosks – in particular, poor households – do have access to clean drinking water. However, their drinking water risks becoming recontaminated during the transportation and storage processes.

Despite the sewage infrastructure only existing on a localised scale, the target group's health situation was not adversely affected on account of the sparse population. The construction of central sewage collection systems would not have resulted in a technically sound service, as water consumption levels are too low. In addition, water consumption is too low for a central sewage system to cover its costs.

The delegation does not have access to any official statistics indicating how well the programme helped to improve the public health situation. Nonetheless, we can assume that the improved water supply has had positive impacts on the health situation. There is still no indication that the programme has contributed to economic development. The noticeable improvement in the population's living conditions, which is manifested in the target group's high level of approval for the supply facilities, is predominantly limited to the

reduced time and effort required to obtain water. As a result, this development primarily benefits women and children.

Impact rating: 3

Sustainability

The operator, the EWSC, currently has a UfW rate of 42%. The operator has not yet taken any steps to analyse the causes of this phenomenon and carry out a corrective action plan. The two district capitals are not regarded as a major priority by the operator, as they only represent 7% of the customers it supplies. Due to the political influence brought to bear on the EWSC, operations-related management positions are left unfilled or filled by appointees who are not properly qualified for the job. For political reasons, the supervisory board's duties have been performed by the Water Ministry's permanent secretary for more than a year. The acting managing director of the EWSC, who was appointed in August 2018, is aware of the problem. However, it is unclear when the necessary measures will be taken.

The operator currently finds itself in a difficult financial position, having posted operating losses for several years. The company's current liabilities are around three times the size of its current assets, meaning that the EWSC does not have sufficient liquidity. Due to losses carried forward from previous years, the equity capital has now been almost completely depleted. For the most part, the planned tariff rises will not be sufficient to bring about a substantial improvement. To stay in business, the EWSC will have to rely on state support to guarantee that its ongoing operation can be financed. Due to Zambia's budgetary constraints, there is a grave risk that sufficient funds will not be allocated for this purpose.

At the time of the local EPE, the EWSC's operating cost recovery rate was 71% in 2017, then 75.5% in 2018. Irrespective of this, the facilities' state of maintenance indicates that the funds used for upkeep are clearly insufficient and that sustainable operation of the supply facilities is under considerable threat. From today's perspective, under the prevailing circumstances, sustainable operation of the promoted facilities is only guaranteed to a limited extent.

Sustainability rating: 4

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 overall developmental 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).