

Ex-post evaluation – Uganda

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Sector: 14030 - Water supply, water management, waste water/solid waste
Project: Protection of Lake Victoria Cooperative Programme, Phase I, 2005 66 737*
Executing agency: National Water and Sewerage Corporation (NWSC)



Ex-post evaluation report: 2017

		Programme (Planned)	Programme (Actual)
Investment costs (total)	Mil. EUR	7.0	14.8
Counterpart contribution	Mil. EUR	1.00	2.2
Financing (FC, EU)	Mil. EUR	6.00	12.6
of which BMZ budget funds**	Mil. EUR	6.00	6.3

*) Programme in the 2016 random sample

***) of which €0.3 million from predecessor programme

Summary: At present, the city of Kampala probably has more than two million inhabitants. The wastewater produced by the city is one of the main sources of contamination for Lake Victoria. Kampala's drinking water is heavily supplied from the lake and Inner Murchison Bay. This programme makes a contribution towards implementing measures identified 2004 in an FC-financed master plan. The programme encompassed (1) new construction of the Lubigi city district plant for treating sewage and faecal sludge from the decentralised sanitation system, (2) expansion of the sewerage system in Lubigi's catchment area and (3) provisional improvement to the Bugolobi treatment plant. The EU financed the programme in parallel from its Water Facility.

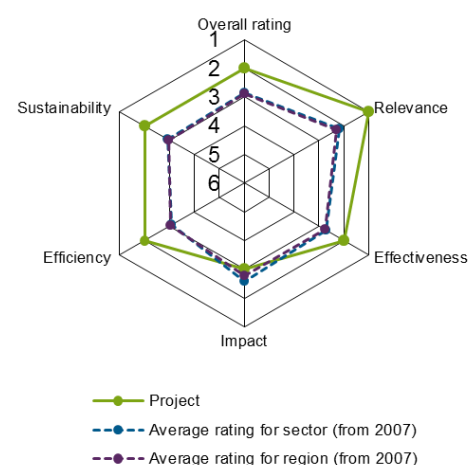
Development objectives: The overarching development policy objective (impact) was to sustainably protect Lake Victoria to preserve its ecological balance. In turn, this was intended to preserve its water quality for producing drinking water and its potential as a viable economic area for the region (fishery, transport, tourism). The programme purpose of the FC measure was to improve protection of Lake Victoria with controlled expansion of the Ugandan capital Kampala's sewage and toilet waste disposal.

Target group: The target group was the entire population of Kampala, around 60% of whom live in informal settlements (approx. 1.3 million residents at the time of appraisal).

Overall rating: 2

Rationale: Overall, the programme-executing agency NWSC is professionally and sustainably operating the programme measures, particularly the Lubigi treatment plant, along with the associated sewerage network and other installations. The programme objectives were achieved with minor limitations; some objectives were surpassed in certain aspects. The programme makes a positive contribution to community hygiene in Lubigi's catchment area and to protecting Lake Victoria, even though its measurable water quality has not improved due to various influences. NWSC is currently fully covering costs through fee income.

Highlights: The FC programme under examination is the first to be implemented within the scope of a wide-ranging master plan (created in 2004, revised in 2015) aiming to comprehensively expand Kampala's urban sewage and basic sanitation systems. The programme is experiencing major national and international interest, causing an important signalling effect for the sector's further development in the whole region.



Rating according to DAC criteria

Overall rating: 2

Relevance

Lake Victoria is Africa's largest lake. For its littoral states of Tanzania, Kenya and Uganda, it is one of the most important drinking water resources, and simultaneously a diverse bio-reserve and source of economic potential (fishery, trade/transport, tourism). Its ecological balance is threatened by the discharge of largely untreated sewage and contaminants. Lake Victoria, on average only 40 m in depth, is classified as extremely sensitive to environmental influences.

The city of Kampala and its effluent loads are undoubtedly one of the main sources of contamination for Lake Victoria. The British built the existing sewage network and Kampala's only treatment plant to date, Bugolobi, prior to Ugandan independence in 1962. Lake Victoria supplies most of Kampala's drinking water. These core problems are still relevant from today's perspective.

The ultimate objective (impact) of the project was to make a contribution to sustainably protecting Lake Victoria to preserve its ecological balance. In turn, this was intended to preserve its water quality for producing drinking water and its potential as a viable economic area for the region. The ultimate objective therefore continues to be highly relevant in our current estimation. The chosen programme approach had the potential to contribute towards solving the problem.

A wide-ranging master plan was prepared for the first time in 2004 with the support of the German Financial Cooperation (FC). This envisaged the comprehensive expansion of Kampala's urban sewage and basic sanitation systems. The master plan, last revised in 2015, plays a central role within the national sewage strategy. The relevant actors in the sector are supporting the implementation of the master plan. These include the Ministry of Water and Environment (MWE), the programme-executing agency National Water and Sewerage Corporation (NWSC), Kampala Capital City Authority (KCCA) and other donors. The FC programme under consideration is the first measure to be implemented as part of the master plan, and as such is contributing to the sustainable protection of Lake Victoria.

Water and sanitation has been and continues to be the key sector for German-Ugandan development cooperation. The programme is part of this, and is consistent with the Federal Ministry for Economic Cooperation and Development's water sector concept. The programme was appropriately and reasonably brought into agreement with Technical Cooperation's and other donors' programmes (in particular, the EU and African Development Bank).

Relevance sub-rating: 1

Effectiveness

The purpose of the FC measure was to improve protection of Lake Victoria with the controlled expansion of the Ugandan capital Kampala's sewage and toilet waste disposal. The measures were able to be adjusted and expanded in 2009, taking additional funds from the EU Water Facility into account. During this cooperation, it became necessary to postpone various programme measures and revise the target indicators.¹

¹ The planned measures to conserve the littoral reed beds at the mouth of the Nakivubo were postponed to the second programme phase following the creation of the Inception Report in 2009. This river forms the Nakivubo Swamp at its mouth, which connects Kampala with Lake Victoria. The programme purpose was modified accordingly in the framework of the evaluation.

The attainment of the programme objectives is summarised below by means of the defined indicators:

Indicator	PA status and target value	Ex-post evaluation
(1) Increasing the volume of sewage transported to the central treatment plant	PA status: 11,500 m ³ /d, Target value: 17,000 m ³ /d	Lubigi: 2,500 m ³ /d Bugolobi: 10,000 m ³ /d Faecal sludge (overall): 600 m ³ /d Total 13,100 m ³ /d Target has not been met.
(2) Improving the treatment plant's purification capacity	PA status: 125 mg/L BOD ₅ Target value: <125 mg/L BOD ₅	Target for Lubigi with 55 mg/L BOD ₅ and Bugolobi with 47 mg/L BOD ₅ in the treatment plant's effluent significantly surpassed . ²
(3) Outlet channel's effluent load	PA status: 300 mg/L BOD ₅ Target value: <150 mg/L BOD ₅	Lubigi = 21 mg/L BOD ₅ Bugolobi = 85 mg/L BOD ₅ Target surpassed for Lubigi and Bugolobi.
(4) Increasing the volume of faecal sludge properly treated from private households' septic tanks (m ³ /d)	PA status: 106 m ³ /d, Target value: 400 m ³ /d	Lubigi = 315 m ³ /d Bugolobi = 285 m ³ /d Significantly surpassed for Lubigi and Bugolobi (600 m ³ /d).

The programme objectives were achieved as measured by the indicators above, albeit with limitations for the first indicator. Although the first indicator signals that the Lubigi plant is only working at partial capacity, it is not under loaded. The BOD load is higher than expected, meaning that there is still capacity when the load is taken into account as the assessment variable. However, the utilisation level is around 80%.

The programme's high acceptance level contributes positively towards target achievement. This is also reflected in the Lubigi treatment plant's good overall utilisation level due to centralised and decentralised sewage and faecal sludge loads. At the same time, the centrally discharged sewage volume is to be increased further with more service connections. The measures to preserve the littoral reed beds at the mouth of the Nakivubo (see footnote 1) were postponed to the second programme phase and are therefore not covered by this evaluation. Altogether, we rate the programme as effective.

Effectiveness sub-rating: 2

Efficiency

The total programme costs came to €14.8 million, including a €12.3 million cost for services and supplies, and consulting costs of €2.5 million.

Accounting for the sewage loads of those connected, the specific total programme costs are around €275 per resident. Comparing this at a regional and national level, we consider these costs of below €300 per resident to be entirely appropriate. We classify the design criteria and technology as an innovative, cost-effective and tailored solution for the region. These design criteria were chosen based on the master plan and the technology implemented within the programme combines centralised and decentralised effluent

² Average values for the 07/2015 - 06/2016 period.

flow disposal. The programme therefore also appears justified in terms of allocation efficiency. The local supporting structures were used sensibly. The programme was efficient with regard to the funds used and the results achieved.

Efficiency sub-rating: 2

Overarching development policy impacts

The ultimate objective for the programme was defined as being a contribution to sustainably protecting Lake Victoria in order to preserve the lake's ecological balance. In turn, it was intended to preserve the lake's water quality for the production of drinking water and its potential as a viable economic area for the region.

Within the evaluation, the incidence of individual diseases and child mortality were used for analysis purposes to assess Lake Victoria's water quality and the development of the health situation in Kampala. The parameters of visibility depth, turbidity and solids content clearly indicate that Lake Victoria's water quality improved between 2011 and 2016 (date of taking the plant into operation: 2013). At the same time, the measuring parameters of chemical oxygen demand, biochemical oxygen demand, nitrate and phosphate call this finding into question, as these were not found to show any improvement. Additionally, the total faecal coliform content in the waters of Inner Murchison Bay increased. An indication of the effluent load and eutrophication increasing overall is the fact that NWSC had to relocate its raw water extraction further into Lake Victoria in 2010, so it could guarantee an acceptable drinking water quality for Kampala. The key local actors in the sector (e.g. the Lake Victoria Basin Commission) agree on the conclusion that Lake Victoria's water quality has constantly deteriorated. However, the weak availability of data only provides limited evidence without a unified picture. A variety of factors are decisive for Lake Victoria's condition and ongoing development; these include rainfall, population growth, economic development, collection and treatment of the municipal and industrial effluent flows and climate change.

Furthermore, the shortcomings in sanitary provision expose Kampala's population to significant health risks. The poor supply of sanitation services can cause serious diarrhoeal diseases (e.g. diarrhoea, cholera, typhus, dysentery). Diarrhoeal diseases are responsible for approx. 8% of all child mortality cases below 5 years of age in Uganda. Although child mortality was considerably reduced from 111 cases per thousand in 1999 to 44 in 2012, 8 deaths per thousands of children under 5 in Kampala were still attributable to waterborne diseases as of 2015.³ Altogether, the number of waterborne diseases in Kampala is on a constant to slightly decreasing trend, with the exception of an extraordinary increase in 2015 due to serious flooding.

The FC measures have been able to substantially improve the drainage and disposal of sewage, particularly in the catchment area of the Lubigi treatment plant. As a result, the measures have definitely contributed to an improved health situation and community hygiene in Kampala, as well as protection of Lake Victoria. In particular, the organised admission and disposal of faecal sludge at the Lubigi treatment plant is an important element for sustainably protecting Lake Victoria, because this sludge would otherwise have had to be discharged into the central Bugolobi treatment plant. However, this plant is already at full capacity with faecal sludge. We can therefore assume that without the FC measure, a high proportion of the faecal sludge treated at Lubigi would have been dumped into the storm water sewers in an uncontrolled fashion. However, there are also further problems and disorganised disposal of faecal sludge, especially during heavy rainfall, due to the insufficient number of service connections and the very high demand for faecal sludge disposal. Moreover, the improvement of the health situation cannot be solely traced back to the programme's effects, since health care, prevention and education were improved in Kampala at the same time.

Although the environmental and health developments were complex, and were influenced and controlled by numerous other factors, as a whole, we can assume that the programme has been able to make a positive contribution to community hygiene and the protection of Lake Victoria. The positive overarching development policy impact cannot be clearly quantified, due to a lack of monitoring of the health situation as

³ Child mortality in Uganda is 55 per 1000 on a national level (World Bank, 2015), and is thus significantly higher than Kampala's value.

well as uncertainties about the quality of data analysed. The programme is currently experiencing major national and international interest, causing an important signalling effect.

Overarching development policy impacts sub-rating: 3

Sustainability

Overall, the programme-executing agency NWSC is professionally operating and adequately maintaining the measures to protect Lake Victoria, particularly the Lubigi treatment plant, along with the associated sewage network and other installations. The vacuum trucks for emptying hard-to-reach latrines in densely built slums, known as "UgaVacs" and financed as part of the programme, are an exception to this generally positive impression. Unfortunately, these were not used and were stored improperly due to institutional responsibilities being unclear. At the same time, NWSC is already independently studying approaches to further develop the Lubigi treatment plant and its methods, as well as cooperating with scientific organisations (e.g. the Swiss Federal Institute of Aquatic Science and Technology – EAWAG) to the same end. The operating staff are sufficiently qualified and motivated. The limitation of incoming faecal sludge, recommended within the scope of the completion control, is currently being consistently implemented. There is therefore no doubt that the plant has fundamentally been run in a sustainable manner since being put into operation in November 2013.

At the same time, there is a need to optimise its operations, particularly in terms of process stability. For example, the anaerobic ponds were intended to be desludged to further improve the Lubigi treatment plant's effluent quality and facilitate full compliance with the effluent quality standards applicable in Uganda. In this way, there could be a further increase in the already decent degree (81%) to which the organic, biodegradable pollution is eliminated on average.

NWSC made a profit of approx. €1.8 million in financial year 2014/2015 after taxes, write-downs and debt service (financial year 2013/2014: approx. €2.1 million). NWSC Kampala contributed substantially to the positive group income with a pre-tax profit of approximately €10.5 million. There is not separate data for sewage, and there has not been any devoted cost centre; nonetheless, there is no doubt that the revenues from sewage rates cannot fully cover the operating expenses of the Lubigi sewage plant. These sewage rates are 75% of the water rate, and on average approx. 15,000 UGX (around €4) per vehicle for incoming faecal sludge. For logical reasons, revenues from the water fees have therefore been put towards a cross-subsidisation within the company.

Overall, NWSC is currently fully capable of ensuring operation with revenues from the water and sewage fees. However, despite being financially viable to date, NWSC's approach may be confronted with limits in the future. This may occur in the event of rising operating and maintenance costs in the context of sewage disposal, e.g. due to planned commissioning of more treatment plants. Although NWSC's business success has been sustainable for over 10 years, it may be necessary in the future to adapt the strategy that is currently in use. In summary, there is a decent starting point for sustainable operation without external financial assistance. The situation regarding cost coverage is currently good.

Sustainability sub-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 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).