Ex post evaluation – Zambia

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Sector: Basic drinking water supply and basic sanitation (14030)
Programme: Rural Water and Sanitation Programme, Eastern Province, phase III, BMZ No.: 2005 65 903* (sub-component)
Implementing agency: Department of Water Affairs (DWA) within the Ministry of Energy and Water Development (MEWD)

Ex post evaluation report: 2020

		Investment (Planned)	Investment (Actual)	Complementary measure (Planned)	Complementary measure (Actual)
Investment costs (total)	EUR million	7.06	6.83	1.40	1.40
Counterpart contribution	EUR million	0.46	0.23	0.0	0.0
Funding	EUR million	6.60	6.60	1.40	1.40
of which BMZ budget funds	EUR million	6.60	6.60	1.40	1.40

*) Random sample 2017. Another component of this project is the Devolution Trust Fund (phase 1), which will be the subject of a separate report.

Summary: Project funding was used to facilitate work on 560 drilled and dug wells in eight districts of Eastern Province, which included rehabilitating existing wells and constructing new wells equipped with hand pumps (output). The programme executing agency was the Department of Water Affairs (DWA), which is part of the Ministry of Energy and Water Development (MEWD). The water sources are operated by village water committees supervised and supported by the Rural Water Supply and Sanitation Units (RWSSUs), which are run at district level and report to the relevant administrative bodies of the eight districts.

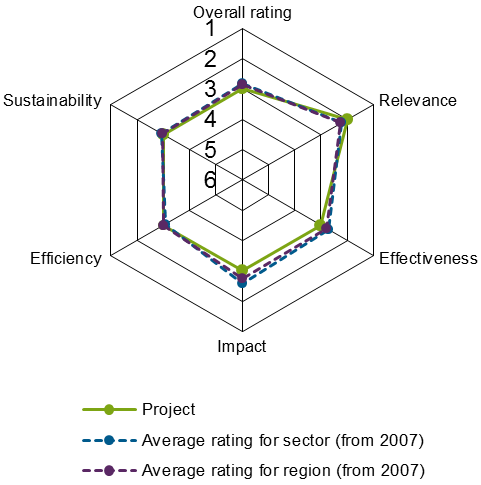
Development objectives: The overarching developmental objective (impact level) was to reduce poverty and health risks for the impoverished population in the rural areas of Eastern Province and urban peripheral areas of Zambia. This goal is shared with the programme as a whole – i.e. also for the Devolution Trust Fund sub-component, which is not the subject of this ex post evaluation. The programme objective (outcome level) of the FC measure was for the target group to have sustainable access to drinking water supply in Zambia's Eastern Province and to use this water supply.

Target group: The predominantly impoverished population (around 100,000 inhabitants), which was previously insufficiently supplied with drinking water in terms of quality and/or quantity.

Overall rating: 3

Rationale: The well committees and communities would safeguard the sustainability of this project by ensuring proper operation, maintenance and repairs during the technical lifespan of the facilities (around ten years). This was indeed the case at all the locations where the wells were at sufficient capacity. However, the efficiency and effectiveness of the programme falls short of expectations in some respects.

Highlights: On a positive note, the quality of the drilled wells that were built is recognised and valued by their users. The chosen design has been very positively received by users who have been interviewed, who describe it as working effectively. The design, material and style can be regarded as best practices in the Zambian context.



Rating according to DAC criteria

Overall rating: 3

Ratings:

Relevance	2
Effectiveness	3
Efficiency	3
Impact	3
Sustainability	3

Relevance

When the programme appraisal report was compiled in 2005, around 52% of the rural population of the Eastern Province had access to hygienic drinking water. However, this aggregate figure obscures serious regional disparities, especially in terms of the supply situation for remote, rural areas where deeper poverty and under-resourced local structures make it more difficult to invest in the supply infrastructure. In 2005, around 90% of Eastern Province residents lived in rural areas. Water-induced diseases have represented and still represent by far the largest proportion of all diseases recorded in Eastern Province's rural health centres.

German development cooperation (DC) has supported the reform process in Zambia for many years, and the water supply and sewage disposal remain a key cooperation sector for German DC in Zambia. The promotion of rural water supply supported the implementation of the National Water Policy and the National Rural Water Supply and Sanitation Programme (NRWSSP), with efforts focusing particularly on poverty reduction, sanitation services and health effects, as well as seeking to deliver appropriate technical systems with high cost efficiency. Overall, the measures chosen were suitable for addressing the core problems.

Taking into account the rural supply situation, the prevailing political environment and the position adopted by German DC, the problem analysis and the selected implementation and operation plan remain correct and still make sense from today's perspective. However, the district administrations were too weak, financially and administratively, to be able to make a relevant contribution towards maintaining the supply infrastructure in accordance with the concept.

The chain of effects is plausible, envisaging an appropriate and uninterrupted water supply, with the potable water used for sensible purposes (primarily for drinking and bodily hygiene), resulting in the assumed health impact. The project (including the Devolution Trust Fund component) was formally implemented as a cooperative programme with GIZ/Technical Cooperation (TC), although no TC contributions were provided during the rural water supply programme in Eastern Province.

Relevance rating: 2

Effectiveness

The FC measure's programme objective (outcome level) was sustainable access of the target group to drinking water supply and its use in the Eastern Province of Zambia.

The achievement of the objective at outcome level (and, implicitly, attainment of the development objective) was to be measured using the following indicators:

Indicator*	Status PA, target PA	Ex post evaluation
(1) In the third year of operation, 80% of the target group in	PA: -- Target: 80%.	>80% – **achieved**

the well's service area use the water supply provided by the programme.		
(2) In the third year of operation, the water quality is compliant with the national standard in 95% of wells.	PA: -- Target: 95%.	The water users surveyed confirmed high water quality at all locations. Nonetheless, 75% of the water quality tests reveal bacterial contamination (although there are still doubts as to the reliability of the water quality tests). The indicator is deemed **partially achieved**.**
(3) In the third year of operation, at least 10 litres per person per day (L/p/d) of drinking water are consumed within the service area.	PA: -- Target: >=10L/p/d.	>10L/p/d – **achieved**
(4) Area pump minders (APMs) and most of the well committees are at least 50% female in membership.	PA: -- Target: >=50% in each case.	Well committee sub-indicator: achieved. APM sub-indicator: not achieved. Overall indicator: **deemed partially achieved (further details below)**.
(5) Shift in hygiene practices regarding transportation, storage and household consumption.	The PP states that this should be determined using a baseline. No further information was provided.	Results from final review in 2011: increase in water volume consumed (15L to 19L). Higher number of portable containers covered (75% to 85%). Storage: no improvement. Number of latrines: increased (71% to 78%). Target achievement: **not verifiable in 2018; indicator not achieved**.

*) The ex post evaluation was conducted in the eighth/ninth year of operation.

**) See explanation provided below.

Overall, we can conclude as of the ex post evaluation that three of the five indicators were fully achieved, one indicator was partially achieved and one indicator had not yet been achieved. Two key indicators for the programme – usage rate and daily water volume – were fully achieved, while the consistently positive ratings from surveyed water users are noteworthy in the context of high water quality.

From the visits to the wells and surrounding areas, in addition to the strong well usage, we can conclude that the water quality is good. In the interviews conducted, members of the community rated the water quality highly or very highly. On the other hand, the water quality tests conducted for the ex post evaluation indicated bacterial contamination in fifteen of the twenty wells tested, although there are still doubts as to the reliability of the water quality tests. For instance, there is no guarantee that the samples were

properly kept under refrigeration while being transported from remote locations to the testing laboratory. Overall, the indicator is deemed partially achieved.

Only a quarter of the wells still have fully functional safety walls. Around half of the wells were completely missing the safety walls, which were put up by the users themselves, while another quarter had walls that were in poor condition. In view of this situation, there are increased health risks from contamination by domestic animals.

On a positive note, all but one of the drilled wells visited were in good or very good condition and were fully operational. Since the dug wells opened, their capacity has fallen significantly – a number of these wells were out of service, with some seasonally affected during the dry season. Additional drilled wells were constructed via various programmes at the affected dug well locations after the project concluded, meaning that local residents were guaranteed an uninterrupted water supply. During the visits, it was found that the average household (household size approx. six persons) fills up at least one 20-litre water tank (Jerry Can) with water on a per-person-per-day basis. This is consistent with the water consumption figures observed during the final review. The wells' consistent proximity to their users helped to promote these strong levels of usage. The supply and planning standard, which was set out during the programme appraisal, aimed for users to generally be no further than 500 metres from the nearest well. This was confirmed in principle for the wells visited. However, some of the wells that received support had since been used by individuals from further away, with some wells reportedly drawing users from as far as three kilometres away. The average number of households supplied is 250, which translates to around 1,500 residents. This is substantially above the supply and planning standard, which was set during the programme appraisal (at least 200 residents). Four of the 25 wells visited have an expanded service area of more than 1,000 metres.

None of the well committees had less than 40% female membership, while women made up at least half of the committees in 80% of cases. This sub-indicator, which is weighted more heavily as part of the overall indicator, is therefore deemed achieved. The area pump minders are predominantly male, with less than 10% of positions occupied by women according to the appraisal delegation's estimates. As a result, this (lower-priority) sub-indicator has not been achieved. Overall, the indicator can be rated as achieved. However, the female membership indicator is not relevant to the evaluation of programme target achievement.

In 2011, the implementation consultant carried out a study to survey changes in hygiene behaviour. This showed that although the jerry cans used to transport water are increasingly capped (increase from 75% to 85%), there has been no improvement in household storage. One of the priorities for the complementary measure (CM) was to raise awareness among villagers, as well as providing health and hygiene education. At the time of the ex post evaluation, there were no indications of the efficacy of these measures. The site inspections revealed that users largely pour their water into buckets, which are difficult to cover. In addition, the jerry cans are not regularly cleaned. The indicator is deemed not achieved.

With the above-mentioned limitations, we rate the effectiveness of the project as satisfactory.

Effectiveness rating: 3

Efficiency

On the whole, the projects were implemented in line with the programme appraisal report's specifications. The measures were planned and implemented between July 2007 and July 2011. Building works started around a year later than had been planned during the appraisal. This was due to the direct award of contracts for consulting services, which lasted for more than a year until the contract signing took place. One of the reasons for the delay was that the consultant was also working on previous phases and had to provide the relevant services before starting on the present phase (III).

The project's total costs were EUR 6.83 million (not including CM). EUR 1.4 million was provided for the CM. Consulting costs accounted for a very high percentage of the total (39% or EUR 2.64 million, not including CM), although this is at the same level as comparable decentralised projects. This high number was a result of the large amount of assistance and travel required for the consultant's work, which was spread across locations throughout the broad expanse of Eastern Province.

Based on total costs, the specific investment costs come to around EUR 26 per user or around EUR 12,200 per well. This falls significantly below the costs incurred by other, similarly designed programmes in Zambia, such as Water Supply in North-Western Province II (BMZ No. 1995 65 060[1]) and Rural Water Supply North West Province (BMZ No. 2000 66 407[2]). In light of the extensive population distribution, we believe that this project was carried out at a very reasonable cost. Due to the lower-than-expected specific costs, it was possible to finance 560 wells instead of the 520 originally planned wells (new drilled wells: 379 planned, 414 implemented; rehabilitated drilled wells: 20 planned, 10 implemented; new dug wells: 100 planned, 39 implemented; rehabilitated dug wells: 20 planned, 97 implemented).

From the target group's perspective, the measures to further expand a support structure for the local rural water supply at district level have had little to no impact. One of the focus areas of the CM was supporting the villagers with establishing and developing a functioning maintenance system for the long term. The ex post evaluators did not meet any of the district maintenance teams in the districts visited. In the original operation plan, these teams were designated as responsible for post-programme support and were also to be available as liaisons for the well committees. The districts' storage facilities for spare hand pump parts are equipped with low quantities of very different equipment and are clearly only used occasionally. None of the RWSSUs were able to provide sound information about the income generated from the sale of spare parts. All vehicles provided through the project are out of service due to their age, various types of damage and a lack of funds to pay for repairs. The RWSSUs do not have adequate transport options available due to the district authorities being under-resourced. The project involved training area pump minders (APMs), who were intended to perform maintenance work on the wells and repair them if needed when requested by the relevant communities. The APMs were consistently found to be active, visiting the wells on a regular basis. To do so, they use local transport services such as share taxis, motorcycle taxis or bicycles. Due to a lack of resources, the RWSSUs can only provide training to APMs at prolonged intervals. At the RWSSU level, the CM had no impact in terms of establishing and developing a functioning maintenance system for the long term. Overall, we rate the production efficiency as just about satisfactory overall.

In terms of allocation efficiency, the investment in the rural drinking water supply infrastructure did meet priority needs of the target group. The capacity levels that were created (in the form of the wells) were of the right order of magnitude and are being fully utilised. The investments in strengthening administrative structures at district level for the local rural water supply are still only partially operational and are either not being utilised or only being utilised to a limited extent. Taking the lack of more cost-effective alternative project approaches into account along with other factors, we rate the allocation efficiency as good and the overall efficiency as satisfactory.

Efficiency rating: 3

Impact

The overarching developmental objective (impact level) was to reduce poverty and health risks for the impoverished population in the rural areas of Eastern Province and urban peripheral areas of Zambia. This goal is shared with the programme as a whole – i.e. also for the Devolution Trust Fund sub-component, which is not the subject of this ex post evaluation. The goal at impact level was to be considered achieved if the following impacts were made as of the ex post evaluation: (i) the health situation of the target group was appropriately improved (based on ex ante and ex post socio-economic studies) and (ii) time can be saved for the target group via simpler water supply and disease avoidance, which in turn has the potential to improve the poverty situation (measurement through random sampling). No socio-economic studies were commissioned before or during project implementation or at the time of the ex post evaluation, nor was the poverty situation measured through random sampling. As a result, it is not possible to evaluate the effects at impact level based on quantitative evidence due to the lack of data.

Given the high prevalence of water-induced diseases, the programme measures were necessary and addressed the supply shortage. For the first time, many people have been given direct access to clean drinking water at an appropriate proximity thanks to the programme. In this ex post evaluation, 20 water quality

[1] Overall rating of 3 in 2008

[2] Overall rating of 3 in 2015

tests were carried out at the wells, with bacterial contamination detected in 15 of the samples taken. However, the above-mentioned concerns regarding the reliability of the water quality tests remain The district health authorities' water quality tests at the wells are only carried out very sporadically and at irregular intervals, and they do not span the entire area either. In the event that bacteriological contamination is detected, the well water is to be chlorinated (note: the districts were informed about the results of the ex post evaluation's water quality tests for bacterial contamination). Against this background, the project is likely to make a contribution to reducing health risks to the impoverished population.

However, it is not substantively clear from the information available whether the overall prevalence of water-induced diseases has decreased in the target population. Although wells and their immediate surrounding areas are kept clean, the canisters and buckets used to transport and store the water often show signs of heavy use and dirt build-up. On the whole, there is a high risk of the clean drinking water drawn from the well becoming contaminated with bacteria while being transported or stored at the user's home. The target group's precarious living and housing conditions are potentially a contributing factor to this drinking water contamination, particularly where small animals are kept ranging freely close to the households. As explained in the Effectiveness chapter, the CM's desired impacts in terms of health and hygiene practices were not readily apparent.

Nevertheless, it should be highlighted that the wells' construction is an important prerequisite for a fundamental improvement in the people's living conditions, as reflected in remarks made by the target group. So overall, we rate the developmental impact achieved as satisfactory.

Impact rating: 3

Sustainability

On the whole, the well committees are able to ensure sustainable operation of the robust hand pumps, which are easy to use and are low-maintenance. During the site inspections, the well committees stated that they were able to finance, organise and carry out smaller repairs, procure spare parts and undertake regular maintenance work (lubrication of chain and bearings). Regular maintenance was not evident on some of the hand pumps inspected. In the event of damage, the well committees organise the procurement of spare parts on their own initiative, usually working together with the APMs. On a positive note, given the high operational readiness and the good condition of the systems inspected, the drilled wells – which have now been in operation for up to 10 years – did not suffer any prolonged technical failures. On the other hand, some dug wells now have too little capacity all year round or seasonally, meaning that they can no longer be used or can only be used with significant restrictions on time, quantity and quality (no consumption of the water drawn). Drilled wells were subsequently constructed at these locations to ensure that the population can still be supplied with clean drinking water.

There is a large quality gap when it comes to maintenance of the areas surrounding the wells. While the concrete slabs surrounding the hand pumps are intact and the pumps are still permanently installed, the safety walls around the water source and the cesspits are mostly in a neglected state. The only systems that are properly maintained in their entirety are water sources close to state institutions such as schools and health stations.

Given the extreme poverty of the target group, the expectation that the target group could gradually set aside sufficient reserves for reinvestment is not appropriate. According to the plans, the water committees would collect a fixed amount each month from the community members, then deposit this into a community account to fund larger-scale repairs and spare parts purchases. The aim was to enable the community to finance future purchases independently using their own funds. Only a few well committees state that they have reserves of up to ZMK 500 (around EUR 45), which are overseen by the committee treasurer. However, this was impossible to verify. For smaller repairs, user contributions are successfully collected on an ad hoc basis, meaning that the wells visited have so far only had short downtimes of a few days. Overall, this allows the well committees to maintain the systems' operational readiness.

We must assume that there will not be sufficient financial resources available if larger-scale system repairs are needed. Since the poverty index is highest in rural areas (>70%), it cannot be assumed that the communities will be able to provide the necessary amount through ad hoc fundraising (around EUR 1,000 to EUR 2,000 for a new hand pump or more than EUR 12,000 for a new drilled well). As a result of this ex-

treme poverty among the target group, it is unrealistic to expect sustainability in the form of sufficient reserves being gradually set aside by the well committees for a replacement investment, so this not used as an evaluation benchmark in this report. Instead, we can assume that this project is sustainable as long as the well committee or community ensures proper operation, maintenance and repairs during the technical lifespan of the facilities (around ten years). This was indeed the case at all the locations where the wells were at sufficient capacity.

The ex post evaluators did not meet any of the district maintenance teams in the districts visited. In the original operation plan, these teams were designated as responsible for post-programme support and were also to act as contact persons for the well committees. This does not have any significant negative impacts on the sustainability evaluation described above.

Sustainability rating: 3

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).