

# Ex post evaluation – Ethiopia

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**Sector:** Water supply and sanitation/waste water management (CRS Code 14020)  
**Programme/Project:** Urban water supply and waste water disposal, 3 towns in the Amhara region (2004 65 567)\*; B+A training 1930 03/2004 305  
**Implementing agency:** Amhara National Regional State Water Resource Development Bureau Bahir Dar



## Ex post evaluation report: 2015

		Project (Planned)	Project (Actual)	Basic & Adv. training (Planned)	Basic & Adv. training (Actual)
Investment costs (total)	EUR million	10.7	10.7	1.00	1.00
Counterpart contribution	EUR million	0.5	0.5	0.00	0.00
Funding	EUR million	10.2	10.2	1.00	1.00
of which BMZ budget funds	EUR million	10.2	10.2	1.00	1.00

\*) Random sample 2014

**Summary:** The project involved the rehabilitation and expansion of the water supply and waste water disposal in three towns of the Amhara region in Ethiopia. The measures included expanding water production, increasing storage capacities as well as enlarging and repairing the distribution infrastructure. The planned sanitation component was not implemented. A basic and advanced training measure was conducted to support the water utilities, which was aimed at improving financial and commercial management as well as operations.

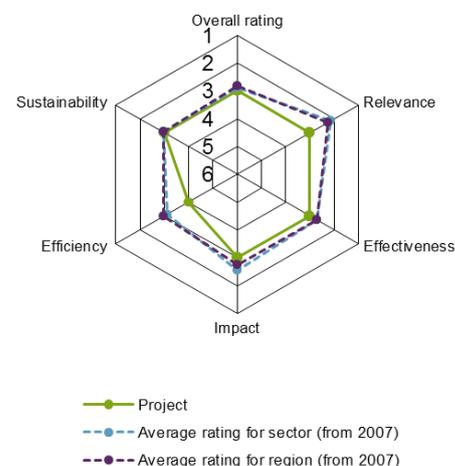
**Objectives:** The aim of the programme was to secure an adequate, hygienic, socially acceptable and economically sustainable water supply for the population. This was to contribute to improving the health and the living conditions of the populations in the towns (ultimate objective).

**Target group:** The target group was the population of the selected towns, particularly the poor segments in the informal urban areas.

## Overall rating: 3 (satisfactory)

**Rationale:** Overall the project contributed to improving the water supply, albeit to a lesser extent than expected. Significant technical defects meant that the efficiency was rated as unsatisfactory. Based on their revenues, the water companies are able to sustain the operations and in some cases have been able to build up reserves. This is why sustainability is still considered satisfactory.

**Highlights:** All three towns have a very high collection rate, which means the utility companies have a steady flow of revenue.



## Rating according to DAC criteria

### Overall rating: 3

#### Relevance

Water supply systems in all three towns were obsolete and at the limits of their capacities at the project appraisal (PA), therefore access to a secure water supply as well as the duration of the water availability were inadequate. Due to this water shortage, a large proportion of the population was dependent on unsafe, i.e. potentially harmful, water sources, such as river and rain water. The project concept provided for the rehabilitation as well as expansion of water supply facilities and measures for the disposal of faeces. Use of the water supply and the improved disposal of faeces were ultimately to contribute to improving the health of the population. This results chain is plausible in principle, and the measures are suitable for reducing the shortage of clean drinking water and contributing to the improvement of health and living conditions. The target group was the urban population of the three cities. This is particularly relevant as insufficient water supply and waste water disposal pose a health threat, especially in densely populated areas. Nevertheless, the potential for health impacts during the actual project implementation was diminished because the sanitary component was omitted for financial reasons. This component originally included support for constructing latrines as well as the delivery of sludge suction vehicles. Neither the Ethiopian government nor other donors have been able to procure means for sanitary and waste water measures in the three towns so far. The health institutions in the towns support households with the construction of latrines and implement hygiene measures.

While the FC targeted an improved urban water supply, the Ethiopian government and a large proportion of other donors focused on improving the water supply in rural areas at the time of the PA. Only recently has the significance of water supply and waste water management in urban areas been increasingly addressed and tackled. The FC therefore identified a significant bottleneck at an early stage and from today's perspective integrates very well into the Ethiopian government's strategy, which has set universal access to clean drinking water as its objective. In terms of development policy, urban water supply and waste water management were no longer the main focus of German development cooperation with Ethiopia at the PA. However, the project was in line with the Millennium Development Goals as well as the sectoral strategy of the Federal Ministry for Economic Cooperation and Development, but only to a limited extent with the latter due to the omitted sanitary component.

#### Relevance rating: 3

#### Effectiveness

The overall aim was to secure an adequate, hygienic, socially compatible and economically sustainable water supply for the population in three towns of the Amhara region. From today's perspective, use of the water supply by the population is considered the project objective. Indicators defined during the PA for measuring the achievement of the objectives are adjusted as part of the ex-post evaluation:

- Since the sanitary component was omitted, the respective indicator is no longer included in the objectives.
- Collection efficiency and water losses are viewed in relation to the criterion of efficiency.
- The water consumption indicator is added to measure use of the water supply by the population.

The target achievement can be summarised as follows. It should be noted here that the towns underwent high population growth during the period in question.

### Indicator 1: Drinking water connection rate (as a percentage of the population)\*

Objective: 100 %

2004 (feasibility study)	2009 (commissioning)	2013 (ex-post evaluation)
Between 76 % and 80 % in the three cities	Between 70 % and 80 % (private connections: between 32 % and 58 %)**.	Between 80 % and 95 % (private connections: between 42 % and 82 %)**.
<p>* The supply level is uncertain and difficult to compare between the years because it relies on estimations about the population size, the size of households, the number of users of public taps and private connections of neighbours.</p> <p>** Private connections in all three towns are mainly yard connections, only few are household connections.</p>		

### Indicator 2: Water quality

Objective: Fulfilment of WHO standards

As a result of clean sources, the water quality is generally good in all three towns. The quality is regularly checked, but the documentation of these inspections should be improved. Local test results from water utilities show occasional deviations from WHO standards, but these are not hazardous to health. Nine water samples were taken from different places in the system during the evaluation visit. These revealed that the chlorine level was insufficient. Two out of the nine samples showed strains of faecal coliform bacteria; one was a yard connection while the other originated in a storage container. The latter indicates a contamination risk after extraction because a sample from a tap in the same household was not affected.

### Indicator 3: Operating cost coverage

Objective: at least 100 %

Calculations of dynamic production costs revealed a clear coverage of operating costs as well as a total cost coverage of approximately 70 %.

### Indicator 4: Water consumption

Guideline value: Taps: 20, yard connections: 30-60 litres per day and consumer

	2009 (commissioning)	2013 (ex-post evaluation)
Litres/day per resident	Between 14.2 and 33.3	Between 18.0 and 43.3
Litres/day per consumer	Between 20.3 and 41.6	Between 21.2 and 48.1

Water supply has improved in the three towns overall, even though not all indicators were fulfilled. In the three towns the drinking water supply ranges between 80 % and 95 % of the population and therefore falls only somewhat short of the target value of 100 %. Water consumption has risen by 50 % in two towns and by 80 % in one town since the commissioning of the water system. First and foremost this reflects the higher number of consumers; water consumption per consumer has only increased slightly. Measured against the guideline value of 20 litres per day and per person from taps and 30 to 60 litres from yard connections, water consumption remains low in some cases. Due to frequent electricity failures and technical difficulties, water production and therefore consumption lag behind their actual potential. The water supply is not always reliable. Moreover, the urban population still uses rain water for washing. The water quality is good, even though too little attention is paid to chlorination. The target of covering operational costs was achieved. The towns can finance selective repairs and parts of network expansions from their own funds, and in some cases they can even put aside savings for a generator.

**Effectiveness rating: 3**

### Efficiency

The project was carried out with an initial delay of approximately 48 months. Increased costs from additional network rehabilitations, price increases and changes regarding the timeframe led to the omission of the sanitary component and the construction of new operational buildings. Furthermore, some components of the water supply system were carried out on a smaller scale than originally planned.

Delays also resulted in the basic and advanced training measure overlapping only marginally with the investment measure.

The basic concept of the implemented water supply systems was adequate: water production areas were chosen in rural regions, relatively far away from the towns, in order to eliminate possible sources of pollution and enable a profitable and high-quality water supply. However, the actual technical implementation was inadequate under local conditions for the following reasons:

- The system contains a complex electro-technical component, which is technically prone to error under the local conditions and requires expert technical knowledge. This expertise is not available at the operators to a sufficient extent, partly as a result of the high turnover among employees.
- External factors, particularly frequent electricity failures, low-voltage fluctuations as well as lightning strikes lead to numerous instances of damage, such as the overheating of pumps. Problems with the Ethiopian electricity supply were known during the development of the technical concept and should have been given more attention during the planning (e.g. by purchasing emergency generators).
- Spare parts for the system are barely available locally, very expensive, and the lack of foreign currency causes great difficulties when actually procuring them.

As a result of these factors, major technical failures and therefore inefficiencies in all three water supply systems arose directly after the commissioning. The operators had to repair and exchange numerous parts, particularly pumps, and operate the system manually. Operators have been able to maintain the water supply overall, but the technical defects have constituted a high financial burden since the system was launched.

Water losses (technical and administrative) were reduced significantly from more than 30 % at the beginning of the project. While two towns perform well with figures of currently 17 % and 13 %, water losses in the third town still stand at 29 %. The maintenance carried out is corrective in nature; preventive maintenance is rare.

As a result of employee turnover, the effect of the basic and advanced training measure to support water utilities is limited. Manuals for operation and maintenance etc. are available, but not used. Billing and cost recording procedures have established themselves on a sustainable basis however, even though the allocation to individual cost groups is not always followed to the letter. The large proportion of customers that are willing to pay for water demonstrates their general acceptance and appreciation of the local water supply, leading to a collection efficiency of more than 95 %. This ensures an extensive coverage of operating costs in the operator's business plans. The water meters are read regularly and invoicing is computer-based. Tariff systems were adjusted in the course of the operating period.

Apart from the shortcomings in production efficiency, the project had a good allocation efficiency compared to the alternative rural water supply for instance: in densely populated towns, where the risk of water-borne diseases is high, a larger part of the population could be reached with the same funding volume than would otherwise have been possible in the case of rural areas.

**Efficiency rating: 4**

## Impact

The overall objective of the project was to contribute to improving the population's health in the three towns. Measurement indicators were not defined. The project led to a quantitative improvement in the supply of drinking water within the population. This has a positive effect on living conditions as long trips to alternative water sources are no longer needed for instance. Since the water quality is predominantly good, it can be assumed that the project also had a positive effect on the population's health. Alongside tap water, households still use additional sources, particularly rain water in the rainy season, but this is mostly used for washing. During longer outages in the water supply for electricity related reasons, water from alternative sources is now generally boiled before drinking. The households interviewed during the evaluation visit are satisfied with the water quality and see no need to treat the water. They report without exception that they have not had a diarrhoeal disease in the past two weeks. According to Health Office statistics in one town, there has been a significant decline in diarrhoeal diseases among children under 5 in the past few years, which coincides with the project period. But this trend cannot be observed for the

other two towns. However, the inadequate disposal of faeces and insufficient hygiene constitute a high contamination risk for household water in all three towns. This risk is confirmed by a water sample from one of the storage containers that contained strains of faecal coliform bacteria. The omitted sanitary component has surely reduced the potential health impacts of the project, but no negative health or environmental impacts were identified.

**Impact rating: 3**

### **Sustainability**

Since the commissioning there have been technical problems in all three towns caused by electricity failures and voltage fluctuations, a lack of qualified staff and strong employee turnover as well as significant difficulties with acquiring spare parts and insufficient maintenance. Although the water sector in Ethiopia overall and urban water supply in particular have been prioritised in recent years by the government and donors, there are currently no external financing sources for the three towns. Thus there is still a risk of the water supply being interrupted for a lengthy period in the event of larger defects. However, the ex-post evaluation also showed that the operators have maintained the water supply so far and that staff feel responsible for ensuring continuous operation. Despite the small budget, water operators have repeatedly exchanged broken pumps and carried out repairs in the past few years. Moreover, the pipeline network has been expanded from own funds in recent years. To a certain extent, KfW recommendations were implemented during the final inspection. For example, a pump in one of the towns was equipped with an adequate starter technology to maintain operations. In addition, savings for a generator have already been put aside in some cases. The high collection efficiency leads to continuous income, which is expected to increase even more by expanding the pipeline network and adjusting tariffs. Despite the difficulties it can be assumed that the operation and therefore the effects will be maintained in the future.

**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:

<b>Level 1</b>	Very good result that clearly exceeds expectations
<b>Level 2</b>	Good result, fully in line with expectations and without any significant shortcomings
<b>Level 3</b>	Satisfactory result – project falls short of expectations but the positive results dominate
<b>Level 4</b>	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
<b>Level 5</b>	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
<b>Level 6</b>	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).