Ex post evaluation – Côte d'Ivoire

Sector: Basic drinking water supply and basic sanitation (CRS code: 14030)
Project: Rural Water Supply VIII (Hydraulique Villageoise Améliorée VIII, HVA VIII), BMZ 1994 65 626* (Inv), 1995 70 151 (complementary measure)
Implementing agency: ONEP (Office National de l'Eau Potable)

Ex post evaluation report: 2020

All figures in EUR million	Inv. (Planned)	Inv. (Actual)	CM (Planned)	CM (Actual)
Investment costs (total)	9.05	15.76	0.97	1.64
Counterpart contribution (government/local agencies)	1.53	1.57	0	0.67
Funding	7.52	14.19	0.97	0.97
of which BMZ budget funds	7.52	14.19**	0.97	0.97

*) Random sample 2018, **) including increase from 26 November 2010 and residual funds from BMZ no. 1990 65 020 (Water Supply in Provincial Towns VI) in the amount of EUR 0.18 million.

Summary: As part of an open programme, simple drinking water supply systems (called HVA systems, i.e. drilled wells, electric pumps, water storage tanks, distribution networks, public standpipes and some house connections) were financed in two phases in rural, electrified villages (1,000 to 4,000 inhabitants). The residual funds were used to provide sanitary facilities for health centres and schools. A total of 112 HVA systems were installed. The last HVA system was transferred in 2017.

A complementary measure to raise awareness of hygiene and provide training for the construction and operation of the water supply and sanitation facilities was implemented.

Objectives: The objectives at impact level (development objective) were to reduce water-induced diseases at the programme locations and to improve the living conditions of the local population.

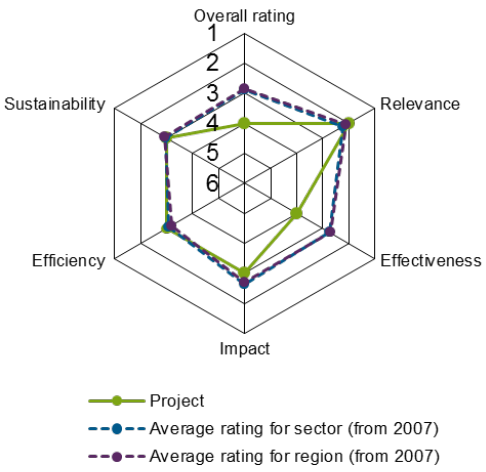
The objective at outcome level was to provide and use sustainable, demand-driven water from HVA systems that is safe for human health, while at the same time upholding basic hygienic principles in the handling of water and wastewater.

Target group: Roughly 400,000 inhabitants of selected rural electrified villages each with a population of 1,000-4,000 inhabitants.

Overall rating: 4

Rationale: The water quality according to WHO standards could not be sufficiently ensured in the HVA systems.

Highlights: The living conditions in a number of small villages improved and a contribution was made to local self-administration. The commitment of German DC in rural water supply, also during the national crises in Côte d'Ivoire, is highly appreciated by the partner government.



Rating according to DAC criteria

Overall rating: 4

Ratings:

Relevance	2
Effectiveness	4
Efficiency	3
Impact	3
Sustainability	3

General conditions and classification of the project

The open programme consists of two phases. The first phase with 67 locations was implemented between 1998 and 2011, with delays due in particular to the national crises in 2002, 2004/5 and 2010/11. The second phase (increase, 45 locations) was implemented between 2010 and 2017.

Under the programme, drinking water supply systems (so-called HVA systems) were built or partially rehabilitated in 112 villages each with between 1,000 and 4,000 inhabitants. In particular, the following project components were implemented within the scope of the project:

- Construction of HVA systems, consisting of wells with electric pumps, water storage tanks, water pipes, standpipes, house connections for schools and health centres;

- Partial rehabilitation instead of new construction of 16 existing wells;

- Provision of dry latrines for schools or health centres at the locations included in the phase of additional financing;

- Provision of chlorination systems.

As part of a complementary measure, the village user committees were accompanied before, during and after completion of the construction work and trained in the technical and financial operation of the HVA systems; awareness was also raised among the village population about the importance of using HVA water and the hygienic handling of water.

The project executing agency for the project is the state-owned ONEP. In addition to the village user committees mentioned above, private operating companies are also partly responsible for operation. According to ONEP, 10 villages are currently being run in phase 1 by some supraregional and some local operating companies. In phase 2, operation in 40 participating villages was initially awarded to a supraregional operator, who, however, did not want to extend the contract after one year for economic reasons.

Relevance

Although Côte d'Ivoire has sufficient water resources in theory, the water supply situation in the country is still inadequate. Particularly in rural areas, lack of access to safe water, e.g. due to contamination of traditional water sources and the wells located in village centres, is accompanied by increased vulnerability to water-induced diseases. Consequently, there is still an urgent need to improve the drinking water supply and to restrict the domestic use of water that is hazardous to health, both in the north of the country, which is particularly affected by political and economic crises and in the rural context in general.

In its drinking water supply strategy, the Ivorian government distinguishes between urban water supply, in which conventional piped systems with house connections (called HU - Hydraulique Urbaine) are provided, and in rural areas, which are to be supplied either by simple wells (known as HV - Hydraulique Villageoise) or by advanced HVA systems (called HVA - Hydraulique Villageoise Ameliorée), which include standpipes, reservoirs and supply lines. The HVA systems constitute the link between HV and HU and, as part of the national water strategy, are the sectoral standard for villages with 1,000 to 4,000 inhabitants.

Due to the Ivorian government's focus on the urban water supply, the supply deficit in rural areas has hardly been reduced so far. Of the roughly 8,500 villages in Côte d'Ivoire, only about 500 villages currently have an HU or HVA system; of the roughly 2,100 HVA systems currently planned, only 337 (about 16%) were installed by 2017. As a result, the rural population in Côte d'Ivoire continues to have a high demand for accessible, safe drinking water.

The programme approach continues to reflect the principles of German FC in the water sector and contributes to implementing the UN human right to water. In the second programme phase, selective aspects of sanitation were subsequently integrated and an integrated approach to drinking water supply and sanitation was created. However, the investments made in the area of sewage were too selective and restricted to be able to remove all the potential sources of contamination.

From today's perspective, the project's underlying impact logic of reducing the prevalence of water-induced diseases by improving rural drinking water supply and thus contributing to the health and improvement of the population's living conditions remains valid. Given this background, the project seems generally suitable for contributing to eliminating the development deficit in the water sector. The original concept defined fixed selection criteria for the villages' participation in the programme. However, over the course of implementation, some criteria had to be scaled back in order to identify a sufficient number of eligible projects. Furthermore, many of the risks known in advance (insufficient social acceptance of HVA water, low capacities for operating and maintaining the HVA systems) were not sufficiently reduced. Another weakness of the conceptual design was the decentralisation aspect. In this respect, the project benefited from the fact that local structures (municipalities, with support from DRH in the preparatory/implementation phase) were assigned an important role. However, these structures did not have sufficient financial and human resources.

The project was in alignment with the Ivorian water strategy and the BMZ sectoral strategy paper for water.

Overall, the relevance can be rated as good.

Relevance rating: 2

Effectiveness

The objective at outcome level was defined as providing and using sustainable, demand-driven water from HVA systems that is safe for human health, while at the same time upholding basic hygienic principles in the handling of water and wastewater.

The achievement of the project objective and thus implicitly the development objective, was to be measured using the following indicators: Based on the data available from programme reports and the random sample of 13 locations, their achievement was assessed as follows:

Indicator	Status PA, target PA	Ex post evaluation
(1) HVA water consumption for the domestic needs of at least 50% of the village inhabitants	Target value PA: 50%	**Target value is not achieved.** The locally available data and the results of discussions with village operator committees and user households suggest the following trends in water use by the population: a) Use of HVA water for drinking and food preparation: about 80% of the village population; b) Use of HVA water for personal hygiene: about 60% of the village population; c) Use of HVA water for cleaning in the household, washing cutlery, clothes, etc.: approx. 30% of the village population. Since categories a)-c) are each essential

		components of household water use and must be fully met, the target value must be considered as not achieved.
(2) Consumption at standpipes and house connections	Target value: Consumption at standpipes of 10-15 l/cd and minimum consumption of 15-20 l/cd for house connections	**Target value is partially achieved.** According to water consumption figures available for the random sample in the evaluation, the average consumption at standpipes is 5-6 l/cd and at house connections roughly 20 l/cd. However, it must be noted that in the operating reports, only some of which are available, the per-capita water consumption at standpipes is relatively low (in individual cases down to below 5 l/cd) due to the assumed 100% use of the population. Assuming a different degree of use, the per capita consumption could potentially be higher. By contrast, the per capita water consumption for house connections is 60-80 l/cd in some cases according to operating reports. However, these estimates are clearly too high, as a house connection is usually also used to supply neighbouring households. Overall, the target value for house connections is achieved. Although consumption at the standpipes is likely to be higher than the consumption data indicate, the target value is not consistently achieved. As a result, the target value is only partially achieved.
(3) Knowledge about hygienic water use and water-induced diseases among the population	Target value PA: 70% of the population has knowledge about hygienic water use and water-induced diseases	**Target value is achieved.** The conclusions drawn from discussions with the hygiene officers in the village committees and the local population as well as from the household surveys and awareness-raising measures carried out by the consultant suggest that over 70% of the population have basic knowledge about hygienic water use and water-induced diseases. At the same time, on the basis of observations on site, it can be stated that this basic knowledge is nevertheless often not sufficiently implemented in everyday life. Consequently, sustainable hygienic water use (clean standpipes, hygienic transport and storage of water) cannot be assumed.
(4) Water supply systems are ready for operation or in operation.	Target value for proposed increase: the systems are opera-	**Target value is achieved** (all systems ready for operation and in operation at least 90% of the time).

	tional or in operation for 90% of the year	With the exception of a small number of individual cases (e.g. lightning strike), there is no evidence of lengthy system failures. This is particularly due to the robustness of the HVA systems. Smaller malfunctions often occur, but are usually resolved quickly. Despite repeated supply bottlenecks with electricity in some cases, an adequate supply of water can generally be guaranteed - thanks to the buffer effect of the water tower.
(5) User committees include women	Target value PA: user committees include 50% women	**Target value is not achieved.** Most of the village user committees, consisting of roughly 6 people, have a maximum of one woman. The women on the user committees usually assume the role of treasurer or hygiene officer. However, it should be noted that most standpipe operators are female.
(6) New indicator: water quality at the point of consumption (household) is based on WHO standards	Target value: 90%	**Target value is not achieved.** Based on the results of the water quality analyses conducted in 12 villages as part of the evaluation, it can be said that water quality at the point of consumption (household) regularly (in 68% of cases) exceeds the maximum number of E.coli germs per 100 ml permitted by WHO recommendations. This can be attributed to: - inadequate protection of the water source against environmental impacts; - lack of water treatment (existing chlorination systems are not used); - failure to put hygiene knowledge into practice in households.

With regard to the achievement of the programme objective at outcome level, it can be concluded that although the water quantities provided meet the domestic water demand and thus satisfy the needs of the target group, the quality of the water provided does not comply with WHO recommendations. The microbiological contamination of the drinking water is directly related to the poor practice of the basic rules of conduct with regard to hygiene (e.g. during transport and storage of the water) and the lack of use of the chlorination systems procured under the FC programme. In the random sample (12 locations), none of the chlorination systems in each case were in operation, although - with one exception - all chlorination systems were confirmed to be operational. This was explained by the insufficient knowledge about how to procure chlorine and by insufficient instruction in system operation. The availability of alternative water sources from traditional shaft wells, wells with hand and foot pumps as well as rainwater also reduce the rate of water consumption of the HVA systems and thus the profitability of the systems.

For the overall evaluation, particular importance is attached to indicator 6 for target achievement. As a result, the effectiveness of the project did not meet expectations, despite the fact that some underlying indicators were met.

Effectiveness rating: 4

Efficiency

The programme funds used for water supply (roughly EUR 15 million) were used efficiently. The specific investment costs are between EUR 20 and 25 per inhabitant in phase 1 of the programme and between EUR 30 and 35 per inhabitant in phase 2. The difference in price between the two phases is explained and also justified by:

(i) Price increases due to the long timeframe (start phase 1: 1998; start phase 2: 2010) and the national crises in Côte d'Ivoire;

(ii) More robust system design in the second phase (e.g. larger reservoirs).

The implementation period of the programme has increased significantly compared with the original schedule. The programme was launched in August 1998. The last HVA systems were commissioned in 2017. As a result, the implementation period was around 233 months instead of the 42 months originally planned. The main reasons for the delays include more extensive preparation and selection of project locations, the national crises and problems with insolvent construction companies.

The water losses during operation of the HVA systems in the random sample amount to an average of roughly 30-35%, in individual cases even 50%, and can be attributed both to technical losses (e.g. in the water storage tank, due to burst pipes and defective valves) and in particular to non-technical losses (unauthorised and unpaid water consumption).

Tariffs for water consumption are set taking political considerations into account. ONEP is working to ensure that the tariff applicable in urban areas is not exceeded in order to guarantee social acceptance of the prices. At the same time, the local tariffs are set by the respective operator committee or village assembly (in the case of municipal operation) or in consultation between ONEP, private operators and the village community (in the case of private operation). According to ONEP, unlike the urban water supply, the tariffs are not subsidised by the government. This makes it even more difficult to operate the HVA systems profitably, and the social compatibility of the investments is worse when compared between urban and rural areas.

Various reports by private operating companies describe operation as non-profitable due to insufficient revenues. In the case of village operator committees, which are most commonly responsible for operations, running costs are covered by current income from water sales. This is due to the fact that hardly any personnel costs (staffing of key positions by volunteers) and hardly any major repairs or maintenance work have had to be financed to date, so electricity costs account for the largest expenditure item. However, the fact that barely any reserves are systematically created and the professional expertise of the local business, management and technical staff is very limited means that medium- to long-term cost recovery is at risk. The production efficiency is thus rated as satisfactory overall.

The choice of HVA systems and technologies is also appropriate from today's perspective for village water supply in rural areas in Côte d'Ivoire. However, the size of the water reservoirs in the first phase, with a uniform 20 m3 water storage tank, does not correspond to the specific water consumption figures calculated in the programme concept, so the dimensions in phase I are insufficient in some cases. Moreover, in some cases the decision to rehabilitate existing wells has proved to be less cost-efficient in retrospect due to the need to construct additional wells at a later date. The village communities each co-financed the infrastructure and complementary measure through their own contribution, as the infrastructure was expected to improve the quality of life. Overall, we rate the allocation efficiency as satisfactory. Efficiency is rated satisfactory on the whole.

Efficiency rating: 3

Impact

The objective at impact level (development objective) is to reduce water-induced diseases at the programme locations. No indicators were defined to measure the achievement of the development objective.

There is no systematic location-specific data that would allow a reliable conclusion to be drawn about the development of public health. However, interviews with the local population and local health centres suggest that the provision of HVA water has a fundamentally positive impact on public health.

Indirectly, the indicators (i) availability of HVA water, (ii) social acceptance or use of HVA water and (iii) quality of HVA water are used to determine the expected effect on public health. However, as outlined in the section on effectiveness, a critical view must be taken of the social acceptance of HVA water on the one hand and the quality of HVA water on the other. Compared with the use of alternative water sources (primarily local wells), it can nevertheless be assumed that HVA water has a positive impact on public health due to a lower level of germs when used regularly.

At the same time, a positive side effect of the programme on the hygiene of the village community and thus indirectly - by reducing germs - on public health can be assumed; even if the hygiene measures at individual household level are not implemented to the necessary extent, it must be emphasised that basic hygiene awareness has been established.

Although not explicitly embedded in the objectives, in terms of the cross-sectional sector of good governance and with regard to the establishment of village user committees to manage the HVA systems, the FC programme has made a major contribution to the local implementation of the principles of transparency, participation as well as accountability and responsibility.

Impact rating: 3

Sustainability

Especially taking the geographical distribution of the project locations and the centralisation of ONEP in Abidjan into account, ONEP does not have sufficient capacities to ensure adequate support. The regional directorates (DTH) responsible on the side of the Ministry of Water, which are also responsible for supporting the municipalities in operating the HVA systems, are unable to provide the necessary support due to a lack of financial and personnel resources. This is consistent with the results of the decentralisation study[1] completed by KfW in 2018 - decentralisation is not the same as participation. The decentralised units must also be provided with sufficient financial resources to enable them to function.

The sustainability of the institutional integration of operation is only ensured to a limited extent. The originally planned village user committees and a local monitoring body only exist in part several years after commissioning, while sustainable operation depends heavily on individuals and their understanding of transparency and accountability. This can be attributed in particular to the fact that the voluntary local commitment is free of charge, and to a lack of monitoring of the operation by DTH or ONEP. The weak support provided by DTH and ONEP for the municipal operation of the HVA systems poses a risk to financial and technical sustainability.

From a technical point of view, a large number of shortcomings in the maintenance and servicing of the HVA systems can be identified in the random sample, which is due in particular to the low level of expertise of local technicians and the non-existence of any support structure. In particular, high water losses due to the failure to detect defects or to respond too slowly when repairs are needed, but also the failure to use the chlorination units and the lack of hygiene at water storage tanks, wells and sometimes standpipes, are an obstacle to smooth operation and to a sustainable water supply that is harmless to health. Although the local technicians were trained under the programme, knowledge is lost due to staff changes in the administrative structure. This is reinforced by the relatively low income of the technicians in a municipal administrative structure.

Awareness of hygiene has helped the local population to gain a better understanding of water-induced diseases. However, the frequent lack of hygienic behaviour shows that the implementation of knowledge in daily practice is lacking.

With regard to financial sustainability, the inadequate coverage of operating costs typical of rural water supply systems in the case of private operation and, at the same time, limited business management skills in the case of operation by the village community raise doubts about efficient and sustainable management in the future. A tariff increase is not politically desirable and could result in lower consumption at the official consumption points. Since no subsidies have been granted to date either, financial deficits will

[1] KfW (2018): Dezentralisierung und die Versorgung mit öffentlichen Dienstleistungen in den Ländern der Sahel-Allianz – Was wissen wir?/ Ergebnisse einer systematischen Suche nach neuerer Evidenz (2013 – 2018), Frankfurt am Main.

arise and thus medium to long-term financial risks. The tendency of the target group at least in the rainy season to prefer the use of traditional well water for domestic purposes for cost reasons further reduces the profitability of the HVA systems. This can only be partially compensated for by higher consumption of household connections. With regard to a sustainable operator concept, the question arises as to whether ONEP's strategy of awarding operation of the HVA systems to regionally active private companies without government subsidies can be implemented. At the same time, the current operating concept shows risks to sustainable operation of the HVA systems, among other things due to the lack of a professional financial and technical support structure and in view of the fragility of volunteer work. Under these conditions it is nevertheless positive to note that all the systems inspected are still in operation - in some cases almost 10 years after they were commissioned.

While the further development of the HVA system towards a central water supply with new house connections is to be welcomed in theory due to the increased consumption, the simpler use and the higher quality of drinking water for consumption, the interim situation (closure of some standpipes due to lower demand, renting of standpipes as private house connections) undermines the idea of general access to drinking water, especially for poorer sections of the population.

From today's perspective and in view of the diverse developments at local level since the HVA systems were commissioned, the technical, financial and institutional sustainability can only be assessed as satisfactory due to the comparatively high operational readiness of the systems over a long period of time despite extremely adverse environmental conditions.

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).