Namibia: Water Supply East Caprivi

Ex-post evaluation

OECD sector	14030 - Water supply and sanitation – small systems	
BMZ project ID	1) 1995 65 383 (investment in fixed assets) 2) 1995 70 235 (personnel support)	
Project-executing agency	Department of Water Affairs	
Consultant	CES/LCE Joint Venture Consultants (implementation consultant) SIAPAC (personnel support)	
Year of ex-post evaluation	**2005**	
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation	1) Q 2 1995 2) Q 2 1995	1) Q 1 1996 2) Q 2 1995
Period of implementation	1) 48 months 2) 12 months	1) 68 months 2) 40 months
Investment costs	1) EUR 4.2 million 2) EUR 0.5 million	1) EUR 4.5 million 2) EUR 0.6 million
Counterpart contribution	1) EUR 0.1 million 2) no contribution	cannot be quantified
Financing, of which Financial Cooperation (FC) funds	1) EUR 4.1 million 2) EUR 0.5 million	1) EUR 4.5 million 2) EUR 0.6 million
Other institutions/donors involved	none	none
Performance rating	4	
• Significance / relevance	4	
• Effectiveness	4	
• Efficiency	4	

Brief Description, Overall Objective and Project Objectives with Indicators

The project comprised the construction and rehabilitation of 215 drilled wells and drinking wells for livestock as well as 13 solar power-operated drilled wells with smaller distribution networks to supply the rural population (22,000 inhabitants) along the Trans-Caprivi Highway and their animals with hygienically safe drinking water. As part of the personnel support, the target group was to be educated about environmentally friendly and hygienic water use and prepared to take on responsibility for the operation and maintenance of the water supply systems through participation in the entire project cycle and via education measures.

Overall objective: The provision of hygienically safe drinking water was to contribute to reducing water-borne diseases and to improving the living conditions for the target group. An indicator to measure achievement of the overall objective was not defined.

Project objective: By the year 2002 reliable drinking water supply that meets basic needs was to be ensured in the project area, and responsibility for the sustainable operation of the systems was to be assumed by the users.

Indicators of achievement of the project objective:

- 90% of the population is supplied with a basic amount of 20 l of water/capita/day.
- Interruptions in water supply add up to less than 20 days per year and per well.
- The quality of the pumped well water satisfies WHO recommendations and/or Namibian standards A or B.
- The operating costs are recovered by the tariff revenuess.
- Needed repairs are carried out within 14 days.

Project Design / Major Deviations from the original Project Planning and their main Causes

The project region was considered to be undersupplied with drinking water. Whereas in Namibia average daily per-capita consumption in urban areas exceeded 314 l and the national average was 103 l, the target group had only 11 l /capita/day. The provisional supply system that was installed in 1980 was in a desolate state owing to collapsed, dried-up or salty wells and supply pipes that conveyed untreated raw water from the Zambezi and Kwando Rivers. The northeastern section of Namibia, where the Caprivi region is located, was affected the most by water-borne or water-related diseases at the time of the project appraisal: 47.2% of all children living in the region who were less than five years of age suffered from diarrhea. Therefore, the main problem was the lack of reliable supply of sufficient hygienically safe drinking water year-round for the population. The disposal of human waste was in need of improvement, yet due to the high intensity of sunlight and the mostly dry climate this aspect was classified as not critical and was therefore not included in the project design. This still held true at the time of the ex-post evaluation.

The target group comprised the rural population along the road from Kongola to Katima Mulilo, 80% of whom are considered poor. This percentage was estimated based on the number of cattle the people owned. Data on the employment situation and on social transfers also gave an indication for classifying the population as poor or extremely poor.

The deficient drinking water supply was to be counteracted by building and rehabilitating 160 hand pump-operated drilled wells to provide drinking water and 55 hand pump-operated drilled wells to provide water for livestock, and also by building 13 drilled wells with solar power-operated underwater motor pumps for small distribution networks. To implement these measures, according to the project appraisal report 45 demand centers were to be created.

From a technical standpoint, the investment measures were implemented largely as planned, albeit 36 months later. This delay was caused mainly by unrest in the area between 1998 and 2001 (attempts by the 'Caprivi Liberation Army' to secede). For project reasons the activities were delayed by about six months as a result of the initial discussion with the project-executing agency about which technology to apply (drilled wells vs. central supply) and of difficulties with monitoring the local firms involved in the project. As the condition of the pre-existing wells

continued to worsen, most of the rehabilitation work was cancelled and the construction of new wells was given preference. Of the 160 planned drilled wells for drinking water, 159 were realized, and 32 of the planned 55 drilled wells for livestock were realized. Instead of the drinking wells for animals, another solar power-operated water supply system with standpipes was built (14 instead of 13 systems). This was justified by the higher population density at another location, since according to information provided the supply for the population via wells equipped with hand pumps could not have been ensured to a sufficient degree. In view of the relatively low number of people supplied by each solar power-operated system (536), in retrospect we cannot completely follow this argument. Instead of the 45 demand centers, 35 management units (Management Unit Water Committees) were formed during the course of the project. These units were based on the spheres of influence of the respective traditional clan leaders. Their tasks included building up and training well user committees and monitoring as well as supporting them. This modification in the design did not have any negative impacts on the number of people supplied.

For the most part, the wells and networks did not begin operating until after the conclusion of the complementary measure, in part with a delay of 2 years. Thus, the user groups lacked practical know-how, e.g. with regard to specific maintenance plans or payment systems. According to the final follow-up, for this reason the consultant who provided the personnel support (SIAPAC) was to carry out two evaluation and two follow-up support assignments in order to ensure the sustainability of the developed solutions. The two follow-up support assignments were not carried out owing to the unrest following the final inspection. In our opinion, this is the main cause of the high number of user committees that are not functioning (see following section). In the year 2003 only one of the two evaluations of the functionality of the user groups and the operational condition of the wells was carried out; our statements in the section containing the impact assessment and the evaluation of performance are based on these results.

Apart from the formation and training of the user groups, the complementary measure helped to set the conditions for the fulfilment of certain requirements. Accordingly, agreements regulating the rights and obligations of the stakeholders with regard to the sustainable operation of the water supply facilities were to be concluded between the project-executing agency and the regional management units created under the project; these agreements were to be concluded prior to the tender for the drilling work and after the provision of extensive information to the target groups. This requirement was met. Factually, however, the agreements are hardly fulfilled at all since 26 of the 35 regional management units no longer exist.

The total cost of – according to the project appraisal report – EUR 4.7 million (including a counterpart contribution of EUR 0.15 million) was exceeded by 9%, so that at the time of the ex-post evaluation the total cost was EUR 5.1 million (excluding the counterpart contribution, since it could not be quantified). This cost increase was due mainly to more intensive work by the consultant in charge of implementation. The share of the consulting costs of the total cost (excluding the complementary measure) of 29% is high. After two increases totalling EUR 1.0 million, the FC funds were used to finance costs amounting to EUR 5.1 million instead of EUR 4.6 million as planned when the project began. There are funds left over from the investment measure (EUR 0.4 million) and from the personnel support (EUR 0.1 million) that are to be reprogrammed to the project 'Namibia, Family Planning/HIV Prevention II.' Approval by the BMZ is still pending. Random checks of the use of the funds that were carried out as part of the final follow-up gave no indications that any funds were used improperly.

Namibia is a target country of German Development Cooperation, which focuses its efforts on the sectors of transport, economic reform and development of a market system, and rural development/resource conservation. In the water and sanitation sector, since 1990 other

projects have been carried out in addition to the present project: the FC project ‘Water Supply System Ogongo-Oshakati’ and the complementary measure to the follow-up project ’Water Reclamation Plant Windhoek’ as well as a groundwater study financed out of the Studies and Experts Fund. German Technical Cooperation (TC) is currently still active in policy advice for management of the water resources and it influenced the content of the ‘Water Resources Management Act’ adopted in 2004. Key provisions of this act include the creation of a 'Water Advisory Council,' a 'Regulatory Authority' and a ‘Water Tribunal' as well as the elaboration of a 'National Water Master Plan.' The law provides for the delegation of responsibility for the operation of rural water supply facilities to the water users. These, in turn, in line with the project structure, are to found a ‘Water Point User Association’ for the operation and maintenance of the wells and a ‘Local Water User Association’ to serve as a kind of special-purpose association combining several well user committees for the coordination of the activities, assumption of supervisory functions and management of the finances. They are to be founded as non-profit associations with legal status. The statutes have to be approved by the competent ministry. In the event that the statutes are breached, the ministry reserves the right to close water points.

Key Results of the Impact Analysis and Performance Rating

The project objective was to ensure reliable drinking water supply that meets basic needs as well as the sustainable operation of the water supply facilities by the users. Achievement of the project objective was to be measured on the basis of five indicators. These five indicators were fulfilled to varying degrees, yet they are subject to high sustainability risks:

- Average per-capita consumption is 15.6 l (target: 20 l). It should be taken into consideration, however, that instead of 22,000 inhabitants as planned, at the time of the evaluation by SIAPAC in the year 2003 around 34,000 inhabitants were being supplied. Therefore, we consider this indicator to be fulfilled.

- Supply interruptions per year and well should not exceed 20 days. Since no precise data about this is available, the achievement of this objective can only be estimated. The SIAPAC evaluation report mentions 34 of 332 wells that are either dry, do not contain sufficient water, or contain water that is no longer suitable for human consumption. Therefore, around 10% of the wells can either no longer be used or only to a limited extent. We consider this as still acceptable in terms of its contribution to achievement of the project objective.

- The quality of the well water must meet WHO recommendations. Although this indicator was achieved with the exception of iron content, in terms of the overall objective its impact is too limited. The quality of the drinking water at the final consumption point should be the deciding factor for the evaluation. According to the SIAPAC evaluation, in nearly 90% of households the people are drinking unsafe water (see also section on the achievement of the overall objective). Therefore, we consider the more broadly defined indicator as not achieved.

- The fourth indicator that was defined involved the ability of the elected user committees to cover the operating costs out of corresponding revenues. 37% of all user committees (70 of 190) that were in charge of the operation of the drilled wells equipped with hand pumps and 6% (10 of 156) of all user committees for the 14 solar power-operated systems either no longer exist or are not performing their tasks adequately. This is expressed by poorly maintained wells, defective infrastructure and use by livestock of wells originally constructed to supply drinking water for humans. 50% of all user committees (of the wells operated via hand pumps) either do not have a payment system, or they have one that does not function adequately. For the most part, the other

50% do not build sufficient reserves, and regular or special fees are charged in only one out of two cases. With regard to the solar power-operated wells, a good 77% of the user committees have a functioning payment system, of which 81% charge fees on a regular basis and 56% have built up reserves. Apart from the poor infrastructure and the since inexistent user committees (which became unable to function due mainly to the withdrawal or death[1] of key persons) the poor understanding of the importance of regular fees for having a functioning supply system was the reason for the low willingness to pay for the water. The lack of supervision and advice for the user committees by the Management Unit Water Committees, of which only nine (of originally 35) were still existent and only two were still operating effectively, were further contributing factors to the lack of coverage of the operating costs in many cases. Therefore, in our opinion the corresponding indicator of achievement of the project objective is not adequately fulfilled.

- No data is available for the indicator requiring repairs within 14 days. Thus, reference is made to the comments on supply interruptions.

Overall objective: The project measures were only partially suited for making a contribution to the overall objective, i.e. to reduce health risks and improve the living conditions. Although hygienically safe water is available at the water points, in many cases the iron content does not fulfil WHO standards, yet this does not lead to any health risks. However, there is still a problem with microbial contamination of the water in the project region. As the transport of the water is often unprotected and the water is frequently not stored properly – i.e. it is stored in open containers, in some cases outside of residential buildings – 90% of the population continues to drink unsafe water.[2] Nearly 22% of all children less than 5 years of age had problems with diarrhea in the month prior to the SIAPAC evaluation (47.2% at the time of the project appraisal). Although this figure is not satisfactory overall, compared to the original situation it shows a considerable improvement. At least one family member fell ill after drinking contaminated water in 14% of the 900 households surveyed.

Overall, based on the criteria of relevance/significance, effectiveness and efficiency, we have arrived at the following assessment of the project's developmental impacts:

By improving the water quality of the wells, the project contributed to reducing potential health risks. However, the problem of water-related health risks was not associated solely with the water quality at the water collection point. Instead, it was and is mainly the result of improper transport and incorrect storage. This risk still exists to a high degree and could not be reduced by the project. The use of surface water for drinking water purposes was another cause of water-related disease that could be significantly reduced for the main water points. However, the number of people who continue to resort to secondary sources such as surface water in urgent cases is still very high. Per-capita consumption increased only slightly from 11 l/capita/day at the time of the project appraisal to 15.6 l/capita/day. Although this was not satisfactory in development-policy terms, it should be noted that the concept of rural water supply including user groups that carry their own responsibility had pilot character, and was

[1] In 81% of the households at least one family member died prematurely or had poorer health. This is due mainly to HIV/AIDS. According to Unicef, in Namibia one out of five people between the age of 15 and 49 is HIV-positive.

[2] In terms of hygiene behaviour, the complementary measure was not very successful. It should be taken into consideration, however, that the planned follow-up support phase could not be carried out owing to the political unrest in 1998 and the following years.

included in the 'Community-Based Management' approach in 1997 as well as in the 'Water Resources Management Act' in 2004. This approach is to be implemented by 2010, which seems ambitious in view of the goals achieved thus far. In the Caprivi region, only 40% of the well user committees and 19% of the special-purpose associations had been set up by 2003, only 12% of the wells had been rehabilitated and only 9% of the wells had been transferred to the user groups via leasing. Nation-wide 21% of the wells were transferred to the user groups. This structural effect and the broad-scale effectiveness of the approach are positive impacts of the project. No transparent comments on the functionality of this structure were available, however; for the project at hand the structure was only partially adequate. Therefore, overall we consider the project's relevance and significance to be slightly insufficient (rating 4).

Reliable drinking water supply that meets basic needs—which was the project objective – was just barely achieved. Approximately 10% of all wells are either dry or no longer provide sufficient water, so that the interruptions in supply are estimated to match the target set during the project appraisal. The drinking water quality is not unsafe at the collection point, but it is unsafe at the final consumption point, which is more critical. We noted that sustainable operation by the user groups is ensured only for the solar power-operated pumps, since in this area 77% of all committees work effectively and take in sufficient financial resources to maintain operation. Yet, these systems supply only around 22% of the target group with water. In the area of hand pump-operated wells, already at the time of the SIAPAC evaluation only around 63% of the wells being operated well or sufficiently. The share of user groups charging regular water fees is only around 29%. Another 24% of the user groups charge water fees for special purposes (e.g. necessary repairs). This does not seem to be sufficient overall to ensure reliable drinking water supply that meets basic needs – the intended goal – on a long-term basis. Therefore, as regards the project's effectiveness, the developmental effects are slightly insufficient (rating 4).

Due to a lack of data on the operating costs, the dynamic generation costs cannot be calculated. As a result, it is difficult to comment on the coverage of the operating costs or on the allocation efficiency. The specific investment costs are extraordinarily high for both technologies: for the hand pump-operated wells they are EUR 74 (incl. complementary measure) and EUR 65 (excl. complementary measure). This production inefficiency was due above all to a steep rise in engineering services as a result of the fact that the areas were difficult to access and the follow-up support efforts were very time-consuming due to the insufficient quality of the work done by the local firms and also due to the local population, which participated in the project execution process. Another factor was the low number of people supplied by the wells. Ultimately, on average only 168 inhabitants used each well instead of 250, which is usually the case. At the time of the project appraisal, the estimate was 100 inhabitants per well. The geographic conditions seem to justify these figures, as the minimum distance between the wells was 1 km and the maximum reasonable distance to each well was set at 2.5 km (or 3 km in exceptional cases). Therefore, it cannot be presumed that a more cost-efficient alternative was available for the hand pump-operated drilled wells. For the solar power-operated supply systems the specific investment costs were EUR 421, or EUR 369 excluding the complementary measure, whereas the reference figure was approx. EUR 120. One solar power-operated system is used by an average of only 536 instead of at least 1,000 inhabitants. Here it seems questionable whether the most efficient solution – in terms of production efficiency - was selected, especially since 62% of the financial resources were used to reach only 22% of the target group. Yet, with regard to the allocation efficiency it can be noted that the operation of the solar power-operated systems is better than the others. Overall, however, we still judge the project's efficiency to be slightly insufficient (rating 4).

From today's point of view, assignment to the category G1 is justified since the project design generally took shorter distances to the wells and shorter waiting times at the wells into account. Both were meant to give women more time to pursue other types of employment. At the time of

the project appraisal, care was taken to ensure that the project would not have any negative environmental impacts on the groundwater level. Corresponding measures such as a minimum distance between wells and the construction of wells to provide water for livestock along the grazing line were carried out.

We confirm the poverty-oriented classification to SHA (self-help-oriented poverty reduction) since 76% of the households in the project region are considered absolutely poor (42%) or relatively poor (34%) according to international standards. Additionally, the project was designed to encourage the target group to organize itself and to take responsibility for the operation of their supply facilities.

General Conclusions

When the project was appraised and a concept for hygiene sensitization measures for rural water supply was being elaborated, the search for the cause of health risks associated with water consumption was supposed to focus not only on the water collection point, but generally also on the final consumption point. In this way, sources of health risks such as improper transport and storage can be taken into consideration as well, enabling adequate project measures to be designed that will help to actually reach the overall objective of reducing health risks.

In this project the personnel support was to begin at the same time as the main measures and end once the supply systems started operating. Thus, the established user committees could not apply their theoretical knowledge in practice (under guidance). Neither could they practice working as committees. Therefore, in future projects care should be taken to ensure that the target group has sufficient time after the systems start operating to be practically trained and to receive guidance for a longer period, to grow together as a committee, and to learn to work together.

In this project, there were plans for the Management Unit Water Committees, which were established under the project, to advise and supervise the user groups. Of the 35 management units that were established, only 2 are still operating effectively. As a result, the user groups are not functioning adequately. Seen from an ex-post perspective, the selected organizational structure does not seem suitable for a more long-term functionality of the user groups. Therefore, advisory services for and supervision of the user groups - also after the completion of the FC measures - should be generally ensured by making the local implementing agency or NGO structures already in place ready for use to secure sustainable working user groups.

In order to be able to measure achievement of the project objective, an effort should principally be made to introduce a monitoring system on the local level with the project-executing agency that will at least include the key information relevant to the project for guidance purposes. This is particularly important if the local project-executing agency is still responsible for advisory services, supervision and/or repair work after the project comes to an end.

Abbreviations:

FC	German Financial Cooperation
TC	German Technical Cooperation

Legend

Developmentally successful: Ratings 1 to 3	
Rating 1	Very high or high degree of developmental effectiveness
Rating 2	Satisfactory developmental effectiveness
Rating 3	Overall sufficient degree of developmental effectiveness
Developmental failures: Ratings 4 to 6	
Rating 4	Overall slightly insufficient degree of developmental effectiveness
Rating 5	Clearly insufficient degree of developmental effectiveness
Rating 6	The project is a total failure

Criteria for the Evaluation of Project Success

The evaluation of the "developmental effectiveness" of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- Are the **project objectives** reached to a sufficient degree (aspect of project **effectiveness**)?
- Does the project generate sufficient **significant developmental effects** (project **relevance** and **significance** measured by the achievement of the overall development-policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the funds/expenses that were and are being employed/incurred to reach the objectives **appropriate** and how can the project's microeconomic and macroeconomic impact be measured (aspect of **efficiency** of the project concept)?
- To the extent that undesired **(side) effects** occur, are these tolerable?

We do not treat **sustainability**, a key aspect to consider for project evaluation, as a separate category of evaluation but instead as a cross-cutting element of all four fundamental questions on project success. A project is sustainable if the project-executing agency and/or the target group are able to continue to use the project facilities that have been built for a period of time that is, overall, adequate in economic terms, or to carry on with the project activities on their own and generate positive results after the financial, organizational and/or technical support has come to an end.