

Brazil: Basic Sanitation Bahia II

Ex post evaluation

OECD sector	14030 / Basic water supply and basic sanitation	
BMZ project IDs	1995 65 185, 1995 70 359, 1995 150	
Project-executing agency	Secretaria de Desenvolvimento Urbano (SEDUR)	
Consultant	GITEC Consult GmbH	
Year of ex-post evaluation	2005	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	1996	11/1997
Period of implementation	48 months	60 months
Investment costs	EUR 6.4 million	EUR 6.4 million
Basic and advanced training	EUR 0.7 million	EUR 1.8 million
Personnel Support	EUR 0.5 million	EUR 0.5 million
Counterpart contribution	EUR 3.6 million	EUR 5.1 million
Financing, of which Financial Cooperation (FC) funds	EUR 6.4 million	EUR 6.4 million
Basic and advanced training	EUR 0.7 million	EUR 1.8 million
Personnel Support	EUR 0.5 million	EUR 0.5 million
Other institutions/donors involved	None	None
Performance rating	3	
• Significance / relevance	2	
• Effectiveness	3	
• Efficiency	3	

Brief Description, Overall Objective and Programme Objectives with Indicators

The aim of the programme was to supply the population in the north-west of the Brazilian state of Bahia with improved basic sanitation as a contribution to improving their health situation. To achieve this, water supply (WSS) and waste water disposal systems (WDS) were built under an open programme in 45 rural municipalities with a total of around 34,000 inhabitants. A complementary measure was implemented to support the programme-executing agency in designing and implementing the programme. To ensure sustainability a conception was developed that included combining the user groups into regional user associations. The establishment of the user association received technical and organisational support under a training measure.

The programme objectives consisted in providing households with a sustainable supply of adequate amounts of drinking water through the new systems and proper elimination of waste water and faeces. By improving the drinking water supply and waste water disposal the programme was intended to

contribute towards improving the health situation of the people in the programme region through the reduction of water-induced diseases (overall objective).

The following indicators were to measure the achievement of the programme objectives:

- a) 45,000 to 50,000 inhabitants were to be supplied through the new systems
- b) the connection rate in the programme locations was to be over 90%
- c) mean water consumption was to be 96 l/c/d
- d) the systems were to be operational 24 hours a day
- e) water losses were to be less than 20%
- f) water quality was to meet the Brazilian standard
- g) system malfunctions per installation were to be fewer than 25 days per year
- h) In all functioning systems the sewage of the connected households was to be either collected or treated in clarifying ponds, or there were to be latrines available, two thirds of which were to be operated properly
- i) sewage volume is at least 75% of water consumption
- j) clarifying pond contamination of < 100 BSB5/l
- k) chamber-type catch pits are emptied every 2-3 years.

The programme target group was the inhabitants of 45 rural municipalities in the programme region, composed of simple rural people earning their livelihood as day labourers, micro business people or subsistence farmers.

Programme design / major deviations from the original programme planning and their main causes

The programme was designed as an open programme. The investment measures comprised the construction of simple central WSS and WDS in the region of Piemonte da Diamantina. Overall, 15 individual and group systems were built. As the establishment of user groups alone was not successful in the past and sustainability problems were to be expected, the creation of a user association was advocated in this programme.

The design of the investment measure was essentially reasonable and adapted to the local conditions. Only in the district of Campo Formoso did the existing wells fail to produce enough water. The measures implemented there generally failed to meet the water needs of the local target population (4,350 inhabitants = 13%). The original project design also proved to be non-viable in the districts of Várzea da Roça/Mairí because the irrigation lines, which were not included for financing under the programme and through which the raw water was to be fed into the drinking water network with chlorine additive, were not built. Some of the construction work must be rated as being of below-average quality owing to faulty execution such as poor laying of pipes and disregard for altitude lines in the feeder line and outlet of community sewage treatment plants. This resulted in an above-average expenditure on repairs and spare parts, causing dissatisfaction among the users and posing a heavy financial burden on the regional user association CENTRAL.

Under the complementary measure, the result of which was very satisfactory, hygiene education campaigns were carried out for the population and instructions were given on the proper operation of the systems. At the same time a training measure was financed to set up the organisation and support the administration of the two user associations in Seabra and Jacobina, and an FC grant was made available to finance the training of personnel. The user association was created, the user groups were established and trained in operating and maintaining the systems and in proper hygiene behaviour.

Key results of the impact analysis and performance rating

According to the programme appraisal report, the legally independent user groups in the communities were supposed to be responsible for the operation of the facilities together with the regional user association of Jacobina (CENTRAL). At the time of the ex-post evaluation, only 25 of the 45 programme communities were still members of CENTRAL. The two biggest integrated systems, each with 10 connected communities, have withdrawn from the user association.

The 10 communities of the district of Campo Formoso withdrew from the user association because of the users' discontentment with interruptions in water supply and high electricity costs since the system went into operation. The candidate for the mayor's office promised to take over the WSS and reduce the water tariffs once she was elected. At the time of the ex-post evaluation these locations were being supplied with untreated surface water by the municipal administration because the FC-financed wells were no longer able to deliver sufficient water. As they reported during our visits to the sites, the users are still not satisfied with the supply situation. Both the quality of the water ("it doesn't taste fresh") and the quantity are causes for complaint (not all municipalities in the network regularly have water). The mayor had requested the Secretaria de Desenvolvimento Urbano (Ministry for Urban Development) for support in the creation of a local user association, but her request was denied.

The current supply situation of the population in the district of Campo Formoso gives cause for concern because the feeding of unchlorinated drinking water into the network carries health risks and violates Brazilian regulations. The engineers of CERB and the Ministry for Urban Development who took part in the visit claimed that the water, which is being taken from a lake that formed out of an abandoned chrome mining operation, does not pose any health risks, but these cannot be ruled out without water quality analyses having been taken. The experience gathered demonstrated that the regional user associations were having difficulty in ensuring the operation and maintenance of large, integrated WSS and WDS in which three or more communities were operating a joint network. Some users reported that the municipal administration of Campo Formoso was not capable of maintaining the WSS and WDS because they lacked the technical know-how, meaning that the FC-financed installations will rapidly decrease in value in the present situation. The department in charge at the ministry is aware of this problem and attempting to exert pressure on the mayor, although it pointed out that the municipality has autonomy in this matter.

In the districts of Várzea da Roça/Mairi it was not possible to feed drinking water into a planned irrigation pipeline as originally planned because this irrigation pipeline was not built. The drinking water network was therefore connected to the dam built by EMBASA in São José do Jacuípe. The general assembly of the user association subsequently decided in December of 2004 to transfer the operation of the system to EMBASA. This made the user association superfluous for this community. In December 2004 EMBASA took responsibility for supplying these 10 municipalities with water but did not restore the operation of the individual installations until October 2005. In the meantime the affected population obtained water from cisterns or purchased drinking water from tank lorries. Given the experience gained with EMBASA it can be assumed that all 10 municipalities will have sufficient drinking water again and that the FC-financed installations will function properly and undergo regular maintenance.

The user association founded in Jacobina in 1998, which ensures the operation of the water supply systems of the remaining 25 communities, supports the local user groups of these communities in the regular implementation of maintenance work as well as in the proper reading of water meters and strict collection of tariffs. In addition to organising as an institution, in the first years it had to focus strongly on repair works on meters, pumps, sewage lines and community sewage treatment plants because of the construction flaws mentioned above. Successive attempts were then made to shift the

capacities to preventive maintenance of the mechanical, hydraulic and electrical system components in accordance with specifically designed operating and maintenance plans. These include, among other things, the inspection and maintenance of control boxes, meters, chlorine dosing equipment and pumps, as well as the cleaning of the drilled wells. As far as possible, simple repair and maintenance work on water reservoirs, distribution and feeding installations is performed by local operating personnel who have been trained by the CENTRAL engineers and are constantly supported and monitored by them. Malfunctions are usually eliminated within a few days because the personnel of the user association have the necessary technical skills, working capital and spare parts.

The water tariffs charged are calculated in such a way that under normal circumstances they are sufficient to cover the cost of operation of the user association. Given that in this programme the integrated systems of the districts of Campo Formoso and Várzea da Roça/Mairi have withdrawn from the user association and that some of the consumers are unwilling to pay the tariffs in two communities as a result of technical difficulties with the water supply, the user association of Jacobina just barely succeeded in covering its operating costs. The ministry in charge is aware of this problem and has provided the building contractor CERB with BRL 1,300,000 (EUR 490,000) to quickly eliminate the most pressing operating problems in the two districts and to put the equipment into a satisfactory operating condition. The financial situation of the user association will probably improve too because around 2000 new customers (from water systems supported by other donors) will join the user association in 2006.

The operation of the 25 communities supported by CENTRAL can generally be rated satisfactory even if the degree of satisfaction is not the same everywhere. We expect that the continuous support of the local operation by the user association will ensure the sustained functioning of the installations.

The improvement of the hygiene situation and the sustained fulfilment of the drinking water needs of currently at least 34,000 beneficiaries not only satisfies an important basic need but also positively affects the target population's health situation. The measures improved the supply situation in the countryside, equalised regional imbalances and benefited a predominantly poor population.

As it actively promoted self-help activities in the creation of the user association and the formation of local user groups the programme built on participation, which had a positive impact on the programme result.

It also had positive impacts on gender equality issues. Before the individual households had their own water connections, water of doubtful quality was often fetched from remote springs, wells or other surface water bodies that were difficult to reach. Women used to spend up to two hours per day fetching water, and they can now use this time for other activities as a result of the programme. The improved water quality and general sanitary situation in the households has also reduced the incidence of disease and, hence, the effort required to nurse ailing family members.

The introduction of consumption-related water tariffs in combination with the installation of water meters has provided an incentive for a more rational use of water, an important instrument for efficient resource management given the low levels of precipitation in the semi-arid programme region. The proper elimination of waste water and faeces prevents contamination of the ground water. In the villages that do not have a central sewerage system, sewage is primarily disposed of through cesspools, which has greatly improved the sanitary situation there.

Most of the programme objective indicators were achieved to a satisfactory degree. Only 76% of the indicator of the population supplied was achieved, but it can be assumed that the projection made for the size of the target group at the time of programme appraisal was too high. In addition, the

concentration of pollutants in the clarifying ponds is higher than intended but currently poses no environmental problems given the self-cleaning capacity of the receiving water. The capacities that have been created are being used intensively. The flaws in the design and execution of the works made it very difficult to operate and maintain the integrated WSS and WDS in the communities of Campo Formoso and Várzea da Roça/Mairí, causing both systems to withdraw from the user association. As EMBASA took over the operation in the districts of Várzea da Roça/Mairí, however, it can be expected that a satisfactory supply situation will be ensured there over the long term as well. Only in the district of Campo Formoso is the situation difficult to assess, as the next steps there strongly depend on how the political conditions develop. However, it is possible that in the medium term EMBASA will take over the operation and maintenance of the systems there as well. Overall, we assign the programme a satisfactory degree of effectiveness (sub-rating: 3).

The sanitary situation of a large portion of the target group has tangibly improved as a result of the programme, and the intended health impacts have been achieved. It is mainly the poor sections of the population in rural areas that benefit from these effects. It is uncertain, however, whether these impacts have also occurred for the population in Campo Formoso (approximately 13% of the target group) because the water systems there are being fed by water from a lake that formed as a result of a chrome mining operation. No reliable data are available to ascertain this, however. The establishment of a user association in Jacobina strengthens the organisational capacity of individual user groups. It makes an important contribution to solving the sustainability problems in the area of water supply and sewage disposal systems in rural areas. The replicability of this operator model for rural basic sanitation (which was already developed in the predecessor programme, however) is also confirmed by the fact that the state of Bahia supports this model technically and financially and that it is being copied in other Brazilian states. The developmental relevance and significance of the programme is satisfactory (sub-rating: 2).

The specific investment costs (production efficiency) are comparatively high. Because the user association in Jacobina, unlike that of Seabra, was just barely able to cover its dynamic operating costs (coverage ratio 104%) and only 46% of the dynamic overall costs at the time of the ex-post evaluation, a lower rating has to be given in regard to the efficiency of the programme. Nevertheless, the almost 2000 connections that will be added are expected to have positive impacts on the sustained coverage of the operating costs in the medium term, so that, given the supply standard that was selected, we rate the programme efficiency as **still sufficient (sub-rating: 3)**.

After considering the above mentioned key criteria, we classify the programme as having a sufficient degree of developmental efficacy overall (rating 3).

Conclusions and recommendations

In regions where other supply companies have no interest in operating water supply and sanitation systems, creating regional user associations for supporting user groups and aiding in more difficult repair works has proven to be a very sound alternative, as shown in the present case, for the operation and maintenance of rural water supply and sewage disposal systems. The experience gathered demonstrated that regional user associations may have difficulty in ensuring the operation and maintenance of large, integrated WSS and WDS in which three or more communities are operating a joint network. In the future it might be better to link only micro and small systems in this model (not more than three communities) in order not to overburden the capacity and expertise of the user association.

In order to prevent water supply and sewage disposal installations successfully operated by the users from being taken over and operated by less efficient municipal administrations, a legal basis should be

created prior to the start of investment in a community that secures the local user groups' right of ownership of the facilities.

Important construction inputs that are not certain to occur should be secured by way of covenants or, in open programmes, as a selection criterion (to be fulfilled prior to construction).

In order to minimise construction design flaws that adversely affect subsequent operation, it should be ensured that the implementing consultant does not accept any of the individual systems until the flaws have been eliminated and that, where necessary, a subsequent/prolonged consultant assignment is financed.

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 conception)?
- 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, organisational and/or technical support has come to an end.