

Peru: Drinking Water Supply / Sewage Disposal Arequipa II

Ex post evaluation

OECD sector	14030	
BMZ project ID	Investment in fixed assets: 1993 65 529 Complementary measure: 1993 70 198	
Project-executing agency	Servicio de Agua Potable y Alcantarillado de Arequipa (SEDAPAR)	
Consultant	GITEC Consult GmbH	
Year of ex-post evaluation		
	Project appraisal (planned)	Ex post evaluation (actual)
Investment in fixed assets		
Start of implementation	3 rd quarter 1993	3 rd quarter 1993
Period of implementation	48 months	45 months
Investment costs	EUR 12.5 million	EUR 10.6 million
Counterpart contribution	EUR 2.5 million	EUR 2.0 million
Financing, of which Financial Cooperation (FC) funds	EUR 10.0 million	EUR 8.6 million
Other institutions/donors involved	-	-
Performance (overall rating)	4	
Significance / relevance	5	
Effectiveness	3	
Efficiency	4	

Brief description, overall objectives and project objectives with indicators

The overall objective of the project was to make a contribution to reducing health hazards to the inhabitants of the city of Arequipa, especially in the settlements on the city fringes ("pueblos jóvenes"). Through the implementation of rehabilitation and extension measures on the water supply and sewage disposal system the availability of drinking water was to be increased and the sewage in the pueblos jóvenes to be centrally collected and discharged. Approximately 20% of the sewage collected was to be treated at the "Chilpina" treatment plant, which was equally subject to rehabilitation in the framework of the project. The purpose of the accompanying measure was to enable the staff of the project-executing agency to properly operate and maintain the sewage disposal system.

The evaluation was based on the following indicators defined to measure the achievement of the project objective:

- a) The population in the pueblos jóvenes, which had been connected to the drinking water supply system in phase I, is supplied with drinking water at least 20 hours per day.
- b) The drinking water produced meets national quality standards, which essentially comply with WHO recommendations.
- c) After three years the rate of connection to the central sewage disposal system in the pueblos jóvenes is at least 75% – in relation to the total number of customers who have a house connection.
- d) At the Chilpina treatment plant approx. 90% of the incoming pollutant load is eliminated from the water and discharge values of 50 mg/l BSB₅ in the 24-hour composite sample are only exceeded in exceptional cases.

Project design / major deviations from the original project planning and their main causes

The project mainly comprised the central collection of waste waters from the decentralised collection systems of the pueblos jóvenes in the east and north-east of Arequipa and to transport them, together with the waste waters produced in other city districts, to the discharge point on the Rio Chili in the south of the city. The population of the pueblos jóvenes had already, on own account and supported with promotional funds provided by the government, installed tertiary collector networks. The existing Chilpina treatment plant was to be rehabilitated and partially extended to cover a time horizon of about 5 years until the planned Pampa Estrellas treatment plant would be put into operation. The Pampa Estrellas treatment was planned to be constructed in a phase III and to treat most of the waste waters of the city of Arequipa. However, as the financial situation of the project-executing agency was very critical phase III was finally not implemented. In addition, a modern network monitoring system was built up to regulate water distribution in the supply network and to reduce water losses. This concept has since been extended by the project-executing agency. In order to protect the raw water sources the spring tapping “La Bedoya” was rehabilitated and a small treatment plant was built. Moreover, tools, vehicles and equipment were procured for the operation of the supply and disposal facilities, and in the context of a personnel support measure the project-executing agency was given training in order to improve the technical efficiency of its staff in the area of sewage elimination. The design and implementation of the project were in line with the concept established at project appraisal, except for minor changes in quantities regarding the main collectors. These changes did not have any negative effect on the achievement of the project objectives.

Though most of the measures were implemented according to schedule and the planned objectives were reached the project design chosen proved not to be fully adequate, which is due to the fact that the sewage disposal situation is not satisfactory (the project component covering sewage treatment was not implemented!) and, thus, there are considerable environmental problems.

Key results of the impact analysis and performance rating

The financial performance of the project-executing agency has clearly deteriorated since project appraisal. This is mainly due to the fact that tariffs, which have not been increased since 1998, declined in real terms. The political influence exerted by the Supervisory Council on the tariff setting of the project-executing agency is to blame for this development. In October 2005 the Supervisory Board again rejected an application by the project-executing agency to raise tariffs, though the tariff increase had already been approved by the national regulatory authority. The Supervisory Board consists of representatives from 32 provincial and district municipalities. In the last few years the majority of these representatives tended to put their interests as mayors beyond their responsibility as members of the Supervisory Board, who should support the economic wellbeing of the executing agency. Moreover, due to the large number of

representatives on the Supervisory Board it is difficult to reach decisions about tariff increases. As tariffs were not increased the project-executing agency can only just cover the dynamic operating costs (operating cost coverage: 108%) and is far from achieving full-cost recovery.

As a result of the tense financial situation the project-executing agency was no longer in the position to properly operate and maintain the sewage disposal systems. The preventive maintenance of the sewerage system through regular flushing was given up and since then only ad hoc maintenance jobs have been undertaken. The old treatment plant is not operated efficiently. The operation of the water supply facilities, however, is good. It is owed to the motivation of the staff and the skilful management of the project-executing agency that the water supply system is still one of the best in Peru. However, in the medium to long term there is the risk that the tense financial situation might impair the water supply.

The main impacts of the project were achieved in terms of reducing health hazards in particular to the approx. 65,000 inhabitants of the pueblos juvenes, which had already been connected to the water supply system in the course of phase I of the project. However, these positive impacts are thwarted by the discharge of untreated waste waters of the city into the Rio Chili. This aggravates the health risks to approx. 42,000 downstream residents and to the (urban) consumers of the agricultural produce cultivated in the downstream area. Overall, the environmental situation is so serious that the regional government called the “environmental state of emergency” (decree N°003-2003-GRAREQUIPA 2003)¹ – though up to now without impact. From today’s perspective the negative environmental impacts are not acceptable and were even slightly aggravated by the project.

The share of poor inhabitants in the pueblos juvenes (approx. 65,000 persons) is over 50%. As a result of the connection to the sewerage system their quality of life has improved substantially. Thus, it can be stated that the project contributes directly to poverty reduction.

It can be assumed that women in the pueblos juvenes benefited from the project because health risks were reduced as a result of the proper discharge of sewage. On the one hand, illnesses of the women themselves are less frequent and, on the other hand, they have to spend less time and effort to care for sick family members.

As regards the water supply component the project objective was entirely reached. The target group including the population of the pueblos juvenes, which had already been connected to the water supply network during phase I, is now supplied with hygienically safe drinking water almost 24 hours a day. For this reason, we rate the efficiency of the water supply component as satisfactory. As regards the sewage disposal component the project objectives were achieved to varying degrees: The most important objective of the project was to collect the sewage, especially in the pueblos juvenes, in a hygienically safe manner and to discharge the sewage from these city districts. This objective was fully achieved since the planned sewage connection rate of the population was clearly exceeded. As a result the situation in the pueblos juvenes does no longer differ from the situation in other parts of the city. The objective in the area of waste water treatment (20% of the sewage collected) was not reached, but given the fact that the sewage disposal situation is generally bad this aspect is only of subordinate importance. Overall, there are clear sustainability risks for the operation of the sewage disposal facilities because the management of the project executing agency does currently not attach sufficient importance to the sewage disposal sector. This is reflected in the lack of staff and poor financial resources made available to the sector. Altogether, we assess the **effectiveness** of the project as **still sufficient (sub-rating 3)**.

¹ Another reason for calling the environmental state of emergency was the extreme air pollution through heavy traffic.

The overall objective of reducing the health hazards to the population was only partially reached. Though it can be reasonably assumed that the health situation of the inhabitants living in the pueblos jóvenes has improved as a result of the project it must be stated that due to the lacking sewage treatment the health risks of the population as a whole (downstream residents and urban population) are still high. According to the health statistics no changes in water-induced diseases (except for a reduction in the number of cholera cases) can be observed. In addition, an important environmental problem has occurred, which is caused by the heavily polluted river, which was one reason for calling the environmental state of emergency for the greater Arequipa area. Though the project was relevant for the target group in the pueblos jóvenes, it did not have any significance for the greater Arequipa area. Thus, we rate the project's **relevance and significance as clearly insufficient (sub-rating 5)**.

Production efficiency is given since the objectives of the project measures were achieved with a reasonable use of funds. Allocation efficiency is not given because the executing agency is only just able to cover the dynamic operating costs but not the full costs. This result is not satisfactory, especially given the fact that Arequipa is the second largest city of Peru. As the mayors have only recently rejected tariff increases improvements in the financial situation of the project-executing agency can at best be expected in the medium term, if at all. For this reason the project's **efficiency is rated as slightly insufficient (sub-rating 4)**.

General conclusions and recommendations

In the present case tariff increases approved by the regulatory authority were rejected by the politically influenced Supervisory Board of the project-executing agency. In order to avoid any counterproductive political influence of supervisory bodies or other corporate decision-makers on the respective utility these should in appropriate cases be treated as part of the target group and be included in personnel support measures. By drawing up special concepts one could try to raise the awareness of politicians to respect economic needs of water supply utilities and to inform them about new ways of publicising (for instance, measures to advertise planned tariff increases). In this way the conflict between politically motivated decision-making and decisions required to ensure the economic success of a water utility might be reduced.

If it can be predicted that necessary tariff increases are difficult to implement politically the required fundamental political decision about the tariff increase should be included in the financing agreements as a binding precondition for the implementation of the project (e.g. as a prerequisite for the disbursement of funds or the tendering of supplies and services). As the case may be, such an agreement would then also cover the possibility of applying sanctions if the provisions on tariff increases are not complied with.

In the case of water supply and sewage disposal projects in large cities particular attention should be paid to the environmental situation. In projects in big cities, in which it is apparent already before the start of the project that the self-cleaning capacity of the receiving stream is not sufficient to absorb the incoming sewage, it would be recommendable first to concentrate on the sewage treatment component instead of the expansion of the water supply component in order to prevent long-term negative impacts on the environment.

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.