

Lebanon: Sewage Pretreatment Plant Al Ghadir

Ex-post evaluation

OECD sector	14020 / Water supply and sewerage – large systems	
BMZ project number	1994 66 046	
Project-executing agency	Council of Development and Reconstruction (CDR)	
Consultant	Supervision of construction: Associated Consulting Engineers (ACE) Supervision of operation: 1. ACE 2. Rafik El-Khoury & Partner	
Year of evaluation	2002	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	Q 4/1994	Q 2/1995
Period of implementation	15 months	30 months
Investment costs	EUR 7.67 million	EUR 7.43 million
Counterpart contribution	None	None
Financing, of which FC funds	EUR 7.67 million	EUR 7.43 million
Other institutions/donors involved	None	None
Performance rating	4	
• Significance / relevance	4	
• Effectiveness	4	
• Efficiency	4	

Brief Description, Overall Objective and Project Purposes with Indicators

The project comprised the completion of the sewage pretreatment plant Al Ghadir in southern Beirut - which was not finished and heavily damaged due to the civil war - as well as the repair of the already existing 2.6-km-long sea outfall pipe.

Its aim was to help reduce the health risks to the people living directly along the coast and to recreational visitors in areas close to the coast. A further aim was to protect the marine flora and fauna in the shallow water zone of Al Ghadir (overall objectives). Water quality as required by the EC Directive on the quality of bathing water was chosen to measure achievement of the overall objective (EC guideline: less than 100 coliforms/100 ml for 80% of the water samples and less than 2,000 coliforms/100 ml for 95% of the samples). The project purpose was to reduce the water discharged from the sewerage systems into the shallow water zone along the coast of Al Ghadir. For this, previously uncontrolled outflowing sewage was to be collected, pretreated at the Al Ghadir plant and discharged into the Mediterranean Sea via the sea outfall

some 2.6 km from the coast. The project purpose was to be considered as fulfilled if, three years after completion of the project,

- the annual average is at least 50,000 m³ of pretreated sewage discharged into the Mediterranean Sea each day via the sea outfall, and
- the emergency discharge of the sea outfall is not activated more than 10 times per year.

The project-executing agency was the Council of Development and Reconstruction (CDR). The project costs add up to EUR 7.43 million and were fully financed through FC funds.

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

Chiefly the measures laid down during the project appraisal were implemented. An exception is the planned construction of a sewage pumping station to connect the northern section of the project area, which was not carried out. This component of the original planning was cancelled owing to a conceptual change (sewage discharge by gravity via the construction of a new collector on the coast).

Key Results of the Impact Analysis and Performance Rating

The project purpose – to reduce direct discharges of sewage from the sewerage systems into the shallow water zone – has not yet been achieved to the extent expected. This is due to the fact that the rehabilitation and expansion of both the main collectors and the secondary and tertiary sewerage networks are progressing more slowly than predicted at the time of the project appraisal. Around 680,000 people were estimated to live in the sewage area of southern Beirut in 2002, of which only approx. 37% - or some 250,000 people – are connected to the sewage pre-treatment plant Al Ghadir. Most of the sea outlets along Beirut's western coast remain open since key main collectors have not yet been connected to the sewage pre-treatment plant.

As regards the indicators of achievement of the project goals, the results are mixed. A clear positive trend could be noted for the volumes of sewage pre-treated each year at Al Ghadir. Current data indicate that in the year 2002 the expected figure was, in all probability, met or even exceeded (average volume of sewage pre-treated during the period June 22-August 21, 2002: approx. 50,000 m³/d). Thus, despite a certain delay, it can be presumed that the first indicator was achieved. However, the emergency discharge was activated much more often than the stated limit of 10 times per year, so that the results clearly fell far short of the second indicator.

Owing to the insufficient progress in rehabilitation and expansion of the sewage collection systems, large quantities of sewage continue to flow via both the Al Ghadir River and the sea outlets directly into the shallow water zone. Thus, it can be assumed that the overall objective of the project was not achieved. The shallow water zone is still bacteriologically contaminated and poses a health risk for area residents and visitors.

Regarding the sector organization, compared with the situation at the time of the project appraisal in the year 1994 a positive development has taken place, even if the water sector still has no satisfactory institutional structure. To date 21 water utilities were responsible for water supply while the communities were responsible for sewage collection, treatment and disposal. Already since 1994 efforts were made to consolidate the water sector. The current legal situation provides for the transfer of responsibility for water supply, sewage disposal and agricultural irrigation to four regional water utilities (Water Exploitation Public Establishments – WEPEs). The WEPEs are to have financial and administrative autonomy. At the time of the ex-post evaluation the WEPEs had been formally founded and were working on implementing the gradual merger of the existing water utilities, designing the staffing structure and assigning

responsibilities as well as on the financial planning. The ongoing reform is a positive development towards more efficient water sector structures. In view of past experience with the difficult reform process, however, at the moment it is still uncertain whether and to what extent the combination of the competences can actually be carried out successfully in the next 2 years as planned. Additionally, the new legal situation still does not clarify to what extent the communities will retain responsibility for sewage collection.

Furthermore, in the water sector there are still considerable deficiencies concerning the tariff and billing system. In the field of water supply there still are not any fees based on consumption. Only very few households have been equipped with a water meter to date (1997: fewer than 5%) since in Lebanon the intermittent water supply causes false measurements for determining water consumption. Thus far the water utilities have charged each household an annual lump sum fee. At the moment the introduction of consumption-based fees is not specifically being discussed. Nevertheless, studies on the existing tariff situation and on the possibilities of introducing such fees are being conducted. In the field of sewage disposal no fees worth mentioning are being charged. Currently the WEPEs do not have any concrete plans to charge sewage tariffs that cover costs. Among other things, this is probably due to the fact that the tasks of the communities and of the WEPEs have not yet been clearly defined.

The new legal provisions do not contain any substantial statements about the tariff systems to be established for water supply and sewage disposal. Therefore, there are no binding rules requiring the introduction of consumption-based, cost-covering tariffs. Consequently, there is still considerable need for reform in order to organize the tariff and billing system in the water sector more efficiently and to guarantee the sustainable operation and maintenance of the water supply and sewage disposal systems.

Since no sewage tariffs are being charged, thus far the operation of the project facilities has been financed solely by funds provided by the project-executing agency CDR. Since operation and maintenance are in fact not among the CDR's responsibilities, they are not paid for out of its direct budget but rather through transfers from Lebanon's current budget. Once the WEPE responsible for Beirut has become fully functional it would be the proper institution to take charge of the plant. Since from today's perspective it is uncertain whether and when the WEPEs will become fully functional, the long-term operating concept and its sustainability remain open.

The attempted project goal has, as described above, not yet been reached to the extent expected. Additionally, owing to the lack of sewerage tariffs and the subsidization of operation by the Lebanese government that is necessary as a result and also owing to the lack of clarification of the operating concept for a long period of time, the project has a high sustainability risk. For this reason we rate the project's **effectiveness** as slightly insufficient (partial evaluation: rating 4).

Due to the overly optimistic assumptions regarding the development of the pre-treated quantities of sewage once the plant started operating, the dynamic production costs determined during the ex-post evaluation exceed the costs calculated during the project appraisal. Nevertheless, in view of the acceptable costs of operation and investments, we consider the production efficiency to be sufficient. However, there is no allocation efficiency at all. At present there is absolutely no cost coverage through tariff revenues. The costs of operation and maintenance are paid for by transfers from Lebanon's current budget. Coverage of the operating costs or even full cost coverage is not expected in the foreseeable future. Overall, we also classify the project's **efficiency** as slightly insufficient (partial evaluation: rating 4).

From today's perspective the project concept was adequate to solve the problem and suited to help reduce the health risks in the coastal area. Even if the impacts of the project are mitigated by the exclusion of the rehabilitation and expansion works on the sewage collection system, its developmental relevance is principally given. However, the sewage discharges into the shallow water zone and the resulting health risks could not be reduced significantly thus far, so that the

project's significance is judged to be insufficient. Overall we classify its **relevance** and **significance** as slightly insufficient (partial evaluation: rating 4).

After weighing the above mentioned key criteria and the continuing risks, we rate the project as having **slightly insufficient developmental effectiveness** (rating 4).

General Conclusions applicable to other Projects

For the project at hand, apart from the actual project measures, extensive complementary measures were required of our Lebanese partners to ensure the project's success. The stated target for the annual average of quantities of sewage pretreated each day was not reached due to the sluggish repair of the sewage collector in the collection area and its connection to the facility. This work was not defined as part of the project. Therefore, it could not be influenced. It would have been helpful to guarantee these complementary measures by way of either appropriate covenants, preconditions for disbursement or possibly co-financing.

Legend

Developmentally successful: Ratings 1 to 3	
Rating 1	Very high or high degree of developmental effectiveness
Rating 2	Satisfactory degree of 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 a project's "developmental effectiveness" and its assignment during the final evaluation to one of the various levels of success described below in more detail 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, organizational and/or technical support has come to an end.