

**Turkey: Wastewater disposal in Isparta**

**Ex post evaluation report (final evaluation)**

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| <b>OECD sector</b>                        | 140 30 / Water supply and sanitation   |  |
| <b>BMZ project IDs</b>                    | 1996 66 231 / 1999 203 / 2001 242      |  |
| <b>Project executing agency</b>           | Municipality of Isparta                |  |
| <b>Consultant</b>                         | Lahmeyer / Gauff                       |  |
| <b>Year of ex post evaluation</b>         | <b>2008</b>                            |  |
|   | <b>Project appraisal<br/>(planned)</b> | <b>Ex post evaluation<br/>(actual)</b> |
| <b>Start of implementation</b>            | 4th quarter of 1996                    | 1st quarter of 1997                    |
| <b>Period of implementation</b>           | 29 months                              | 43 months                              |
| <b>Investment cost</b>                    | EUR 15.3 million                       | EUR 14.2 million                       |
| <b>Counterpart contribution</b>           | EUR 2.0 million                        | EUR 0.9 million                        |
| <b>Financing, of which FC funds</b>       | EUR 13.3 million                       | EUR 13.3 million                       |
| <b>Other institutions/donors involved</b> | -                                      | -                                      |
| <b>Performance rating</b>                 | 2                                      |  |
| • <b>Significance/relevance</b>           | 2                                      |  |
| • <b>Effectiveness</b>                    | 2                                      |  |
| • <b>Efficiency</b>                       | 3                                      |  |
| • <b>Overarching developmental impact</b> | 2                                      |  |
| • <b>Sustainability</b>                   | 3                                      |  |

**Brief description, overall objective and project objectives with indicators**

The project covered the construction of the first stage of a wastewater treatment plant in the city of Isparta for a population equivalent of 160,000. The objective was to ensure that the city's wastewater would be disposed of in an environmentally sound and hygienically safe manner. The overall objective was to help protect the future drinking water resources of Antalya (Karacaören dams), help reduce the wastewater-related health risks to the population in the municipal area of Isparta and to contribute towards water conservation. The indicators defined in this connection relate to the quality of the treated wastewater. To back up the investment, training was conducted for electricians and mechanics, while capacity development measures for the plant's managers improved their managerial and administrative skills.

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

To date only a minority of the inhabitants of Turkish towns and cities have been connected to a wastewater treatment plant. Prior to the project under review, this also applied to the secondary centre Isparta. The design of the wastewater treatment plant incorporates a long-term, modular expansion strategy, taking due account of the strong population increase and the vigorous economic growth in the region. The installation is designed as a high-rate activated sludge

plant. It was put out to tender on an open-process basis as a turnkey plant and built according to the contractor's plans. It is located outside the settled area on the main drainage channel of the local irrigation system. This location provides ideal conditions for future expansion of the disposal area (no zoning restrictions) and for the diversion of the treated wastewater. An administrative building was erected and equipped to house the requisite operating facilities, including the central control room, offices, the laboratory, workshop, storage rooms and staff amenities. In addition to office, laboratory and workshop equipment, spare parts and wear-and-tear components were supplied for the start-up phase. As early as 2001, the wastewater to be treated exceeded the plant's capacity by around 35 %. Expansion work – financed with Turkish funds – was thus initiated in 2007.

The unit responsible for operations is generally capable of running the wastewater treatment plant and carrying out simple maintenance work. Measurements and checks are performed every day to monitor the inflowing wastewater. Daily or weekly measurements of various physicochemical parameters are taken to monitor the quality of the treated and untreated wastewater. On the whole, the commercial running of the plant can be rated as good, while the technical operations are still characterised by deficits (above-average wear and tear and frequent need for repairs). According to the municipality of Isparta, there are plans to contract out the operation and maintenance tasks to a private company to fully ensure that the plant is kept in proper functioning condition. However, the current managerial staff would retain their inspection and supervision responsibilities.

### **Key results of the impact analysis and performance rating**

The wastewater treatment plant removes a major development policy bottleneck and is seen as a model project for Turkish secondary centres. The only reservations refer to the insufficient capacity of the design. Nevertheless, the overall rating for **Relevance** is good (subrating 2).

On the basis of the indicators defined at the time of the project appraisal, the project objectives were achieved. At the same time, it must be pointed out that approximately 25 % of the raw sewage is still discharged untreated into the outlet ditch owing to the inadequate treatment capacity of the plant. Moreover, a number of farmers are using treated water illegally for irrigation purposes. The disposal of sludge in an environmentally sound manner continues to pose a problem. **Effectiveness** is nonetheless assessed as good (subrating 2).

Although the original implementation agreements stipulating the introduction of sewage charges were not complied with, operating costs were met by raising water tariffs and through municipal allocations. We consider the covering of these costs to be secure in the long term, especially since the specific costs of wastewater treatment in Isparta are very low. The accompanying measures were only successful in part owing to delays in the training activities and changes in staff. The **efficiency** is deemed satisfactory (subrating 3).

As the project did not include a component to expand wastewater diversion within the municipal area of Isparta, its contribution towards reducing wastewater-related health risks there can at best be marginal. A sewer network with a high connection rate was already in existence before the wastewater treatment plant was constructed. As it was used to channel wastewater out of the municipal area, it is not surprising that statistically no change was ascertained in waterborne diseases. The quality of the treated wastewater being conveyed to the dams is now unobjectionable. It is anticipated that the problem of the partial discharge of untreated wastewater will be eliminated by the end of 2008 through the additional capacity created in Phase II at the Isparta plant. The **overarching developmental impacts** are judged to be good (subrating 2).

The operation of the plant appears to be financially secure on a sustainable basis although sewage tariffs are yet to be instituted; moreover, it is likely that such charges will be introduced in the medium term. The project appraisal did not correctly assess the possibility of using the sludge in farming. Contrary to earlier, more optimistic expectations, the issue of sludge disposal has not been resolved: the environmental authority did not approve its release to the agricultural

sector and there is no alternative concept for disposal. So far, however, this has not given rise to any problems. Training measures were not sustainable; impacts of privatisation cannot as yet be assessed. **Sustainability** is considered satisfactory (level 3).

Weighing up the above key criteria, the overall evaluation results in a performance rating of 2, i.e. the project demonstrates **good developmental efficacy**.

### **General conclusions and recommendations**

A crucial prerequisite for the proper running of the newly erected plant was the availability of qualified personnel at the time of start-up. This was only partly the case despite the training measures conducted, which led to operational breakdowns and to the failure of technical installations resulting from faulty operation. Similarly, the below-average life service of components of the electromechanical equipment indicates deficient maintenance. As a result, spare parts had to be procured within the scope of the support and supplementary training programme in order to render the plant fully functional again. If more pressure had been applied to realising the agreed training concept, there would have been fewer problems with regard to insufficient staff training. Greater emphasis should be given to insisting on the qualification of personnel in comparable situations. This should go hand in hand as far as possible with the contractual binding of staff for a minimum period of service after undergoing their training.

The high utilisation factor of the wastewater treatment plant was already foreseeable during the planning phase as at that time 85 % of the population was connected to the existing sewage collection system. In retrospect, it would have made more sense to design the project with higher treatment capacities. However, the limited funds available would probably have necessitated project planning in several phases.

### **Notes on the methods used to evaluate project success (project rating)**

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness (outcome), "overarching developmental impact" and efficiency. The ratings are also used to arrive at a final assessment of a project's overall developmental efficacy. The scale is as follows:

- 1 Very good rating that clearly exceeds expectations
- 2 Good rating fully in line with expectations and without any significant shortcomings
- 3 Satisfactory rating – project falls short of expectations but the positive results dominate
- 4 Unsatisfactory rating – significantly below expectations, with negative results dominating despite discernible positive results
- 5 Clearly inadequate rating – despite some positive partial results the negative results clearly dominate
- 6 The project has no positive results or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

### **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 an improvement is very unlikely. 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. A rating of 1 to 3 indicates a "successful" project while a rating of 4 to 6 indicates an "unsuccessful" project. In using (with a project-specific weighting) the five key factors to form a overall rating, it should be noted that a project can generally only be considered developmentally "successful" if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are considered at least "satisfactory" (rating 3).