

Turkey: Environment Project Dalyan/Köycegiz

Ex post evaluation

OECD sector	14020 Water supply and sanitation - large systems	
BMZ project ID	1) 1991 66 109 (real investment) 2) 1994 70 212 (complementary measure)	
Project executing agency	Environmental Protection Agency for Special Areas, EPASA, formerly Authority for the Protection of Special Areas (APSA)	
Consultant	Otto Consulting Group, Oeko/IP/IGIP/UBM/BEL-DA	
Year of ex-post evaluation report	2010	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	1) Q 1 1994 2) Q 1 1994	1) Q 2 1995 2) Q 3 1999
Period of implementation	1) 45 months 2) 45 months	1) 100 months 2) 71 months
Investment costs	1) EUR 12.8 million 2) EUR 0.51 million	1) EUR 24.91 million 2) EUR 0.51 million
Counterpart contribution	1) EUR 5.62 million 2) ---	1) EUR 7.53 million 2) ---
Financing, of which Financial Cooperation (FC) funds	1) EUR 7.16 million 2) EUR 0.51 million	1) EUR 17.38 million 2) EUR 0.51 million
Other institutions/donors involved		
Performance rating	3	
• Relevance	3	
• Effectiveness	2	
• Efficiency	4	
• Overarching developmental impacts	2	
• Sustainability	3	

Brief description, overall objective and project objectives with indicators

The project aimed at conserving protected areas around the towns of Dalyan and Köycegiz, which were declared a specially protected area in 1989. The project was to contribute to conserving the ecological balance and reducing the health hazard for the population and tourists in the project area (overall objectives). The project objectives of the measures were (1) to reduce contamination of Lake Köycegiz and the wetlands in Dalyan due to sewage, (2) limit soil and groundwater pollution due to municipal waste in the entire protected area and (3) supply Dalyan and Köycegiz with clean drinking water.

The indicators for measuring project success were defined at project appraisal as the quality of water in the lake and in the wetlands (overall objectives), requiring the maintenance of Water Quality I (< 4 mg BSB5) in both despite increasing settlement and use by tourists. The project objectives were to be deemed to have been achieved if no serious disposal deficits were recorded in the disposal area (prohibited discharge of wastewater, overflowing septic tanks, illicit refuse dumps - Project objectives 1 and 2) and if no coliform bacteria were detected in at least 80% of the official water samples (Project objective 3). In the special agreements, an additional indicator was defined for the purification capacity of the sewage plants: effluent rates from the treatment plants of < 30 mg/l BSB5. The set of objectives is adequate overall but by today's standards the drinking water quality grades would have been geared to national thresholds in keeping with current EU limits and considering the measures implemented another indicator should have been defined for the connection rate of the population to the new sewage system (80%).

Project design/major deviations from original planning and main causes

The project comprised three investment components: i. construction of sewerage systems and treatment plants in Dalyan and Köyceğiz, ii. construction of a regulated municipal waste landfill and iii. the improvement of water supply systems in Dalyan and Köyceğiz. In addition, a complementary measure was financed to set up an integrated special-purpose association. Altogether, the measures were executed as planned. However, the following deviations occurred, which affected performance:

Sewage disposal: The two sewage plants in Dalyan and Köyceğiz were erected with a capacity of 16,000 equivalent inhabitants each, divided into two parallel treatment channels, that is altogether 32,000 equivalent inhabitants (planned size: 23,300 equivalent inhabitants) and with almost identical processing technology (activated sludge - instead of the originally planned pond sewage treatment plants). The choice of a different treatment technology than provided for at project appraisal is also warranted ex-post because the necessary purification results could not have been achieved with the pond sewage treatment plants. Except for the high season, only one treatment channel is operated in Dalyan. In Köyceğiz, only one of the two channels has ever been operated since commissioning. Average inflows amount in Dalyan to 3,450 equivalent inhabitants (207 kgBSB5/d) and in Köyceğiz to 4,880 equivalent inhabitants (293 kgBSB5/d). Average capacity utilisation in Dalyan amounted to only 22% and in Köyceğiz to only 31%. Maximum figures for Dalyan in 2008 were 10,430 equivalent inhabitants (626 kgBSB5/d) and 10,870 equivalent inhabitants (652 kgBSB5/d) in Köyceğiz. Even though hydraulic capacity utilisation rates are higher due to the high extraneous water inflow, the general operation of only two of the four treatment channels shows that installed capacities were far in excess of needs here.

The sewerage grid was extended more than originally planned. Altogether, sewerage was installed in the whole densely built-up zones in both Dalyan and in Köyceğiz covering an area of about 200 hectares and 300 hectares resp. (planned size: 55 hectares and 180 hectares resp.). In addition, the neighbouring municipality of Toparlar with an area of about 100 ha was also connected to the Köyceğiz sewage treatment plant.

The septic tanks at the periphery of the municipalities are reportedly emptied regularly and the faecal sludge transported to the sewage plants. However, large quantities of sewage from the remaining pits of residents who are not connected to the central sewage disposal system continue to seep away, particularly in Köyceğiz. This problem can only be remedied by raising the number of connections further.

Waste disposal: In the course of the project, the central waste disposal site was erected in Ortaca with a capacity of 250,000 m³, which falls well short of planning. The landfill receives the waste from the special protected area, from all hotel complexes and the local municipality Ortaca. At final inspection, approx. 55,000 residents from the project area were connected to waste disposal, whereas the figure is now approx. 70,000. However, as of 2008 refuse is also transported to the landfill from neighbouring Dalaman, so that it now handles waste from approx. 94,000 people. The disposal of the refuse from municipalities outside the project area was explicitly ruled out in a provision of the financing agreement, which was also appropriate for attaining project objectives. According to the operator, the acceptance of waste was stipulated by the provincial government, since the neighbouring district of Dalaman had a legal right to use the landfill. Because of this, the annual waste volume has increased by approx. 30%, so landfill capacity will be used up faster, despite the smaller volume of waste than planned (current capacity utilisation: 40%). Assuming an annual rate of increase of 5% of waste volume, the landfill body will be filled up by the beginning of 2016 at the latest (instead of 2020 as planned). There are plans for building a new landfill near the present location, but the approval procedure has not yet been completed, nor is finance assured.

Water supply: The measures in water supply comprised the rehabilitation (Dalyan) and/or the extension (Köycegiz) of the water supply plants of the two municipalities. Finance was specifically provided for wells, chlorine dosing facilities, water catchments, pipelines and service connections. The scale of the measures carried out was considerably enlarged compared with project appraisal.

In Dalyan, almost the whole distribution network was renovated (planned 5,000 m, actual 35,400 m). The old grid has now been completely taken out of operation. In Köycegiz, additional wells were rehabilitated and catchments repaired.

In both municipalities the amount of water supplied increased considerably as compared with project design (Dalyan: planned 1,475 m³/d, actual > 3,500 m³/d; Köycegiz: 1,686 m³/d, actual 5,000 m³/d). In relation to the connected population, these available capacities would appear to have been overestimated, also accounting for tourist needs. As a direct consequence of the large amount of water available, there is less need to reduce grid losses (estimated at up to 60%), as the population has no shortage. The surplus created does not therefore contribute to the economical use of water.

The original project design provided for setting up a regional special-purpose association for the operation and maintenance of the project facilities. Due to delays in the introduction of new municipal legislation and political opposition, operational responsibility was then finally assigned to the municipalities. The strategy of a special-purpose association was, however, revived in 1995 and specified by KfW as a condition for signing the financing agreement (1996) in a supplementary project appraisal. The special-purpose association was founded in 1997 and responsibility for operating all project facilities was assigned in 2000. The municipality of Dalyan has now withdrawn operating rights from the special-purpose association so that it is now only responsible for operating the Köycegiz sewage plant and the landfill. Viewed ex-post, the project should have refrained from the planned operator model of a special-purpose association, because the measures did not ultimately fit in with local institutional setup. On the other hand, the present operational arrangements have had no major consequences for objective achievement (see next chapter).

In summary, after a 6-year delay the project succeeded in setting up an operational sewage/waste disposal and water supply system, whose capacity appears, however, to be in part oversized (e.g. treatment plants, input capacity in water supply) or will be exhausted earlier than planned (landfill).

Key results of impact analysis and performance rating

Responsibilities for the individual project components are very complicated and split up among the special-purpose association, UNION, and the municipalities. The special-purpose association is meanwhile only in charge of operating the Köycegiz sewage plant and the landfill in Ortaca. It still performs supervisory and advisory functions for the Dalyan treatment facility. Individual activities (also fee collection) are conducted by the municipalities in keeping with new municipal legislation. Scope for synergies resulting from the operation of two identically constructed facilities has only been harnessed to a limited extent due to the fragmented operational competencies.

The operation of the project facilities is smooth for the most part and of good quality. There are, however, certain sustainability risks to the continuance of the special-purpose association and with that service delivery, as the ex-post evaluation indicates that the municipalities do not attach priority to remedying defects in sewage disposal.

As anticipated at appraisal, the project makes a major contribution to conserving the unusual flora and fauna in the project area, which contributes to preserving the main source of income for the local population - tourism. It afforded no scope for contributing to gender equality. Ex-post, we concur with the rationale of making a contribution to participatory development and good governance by establishing a special-purpose association run by the municipalities, even though this scheme could only be implemented in part. The project was geared to achieving a general developmental impact with no special poverty relevance.

In summary, we assess the developmental efficacy of the project as follows:

At project appraisal, the objectives of the project conformed with those of the partner country policy and the German Federal Government, whereas today's FC commitment focuses on promoting towns in the less developed East of the country. The supply of clean drinking water to the population and tourists in the project area remains a constraint in hindsight. Proper sewage and waste disposal in the project area is still essential for the conservation of the protected area as a basis for economic development through tourism. The project contributes to the aims of the Convention on Biological Diversity as well as to Millennium Development Goal 7. The measures were largely appropriate for achieving the anticipated results and the project and overall objectives. However, the approach of the complementary measure to set up a special-purpose association was not in keeping with the local institutional setup, which ultimately resulted in an overcomplicated allocation of operational responsibility and the failure to meet the requirement prohibiting municipalities outside the project area from disposing of waste on the landfill. The partly insufficient donor coordination did not impair the effectiveness of the project. Due the institutional setup, we assess the relevance of the measures in all as satisfactory (Subrating 3).

For the most part, the project objectives were met. The two treatment plants serve about 80% of the population in Dalyan and Köycegiz as well as an additional 50% of the population in the neighbouring municipality Toparlar. The effluent quality of the sewage plants conforms with the plans at the time and in part keep well below the legal specifications. However, the Turkish threshold for phosphorus was raised considerably

in 2006 (to 2 mg/l). The facilities that only operate with biological phosphorous elimination cannot always maintain this figure. Unregulated discharges into surface waters reportedly no longer take place. The measure has clearly curbed soil and groundwater pollution due to municipal waste in the entire protected area: The refuse from the whole project area is collected in an orderly way and dumped on the landfill in Ortaca. The 15 illicit refuse dumps that still existed at final inspection have now been closed and in part already transported to the landfill. The remaining ones are scheduled for relocation soon with finance from the environmental agency, EPASA. One problem is the deposition of organic waste, which is partly mixed with other refuse in Dalyan and at a municipal location in Köycegiz. Another deficit is the leakage of large quantities of sewage from the soakaways still existing in Köycegiz, which continue to pollute groundwater. As more than 80% of the population are now connected to the sewerage system, the sub-component plays a subordinate role only in comparison with the project objective achievement of the whole component. The rehabilitated or extended drinking water facilities supply the whole population in the Dalyan and Köycegiz municipalities as well as the tourists in summer. Drinking water quality is regularly monitored, is subject to high national statutory standards and is of high quality. The old grid in Dalyan has now been taken out of operation. We therefore assess the effectiveness of the measures as good altogether (Subrating 2).

The specific investment costs are reasonable in comparison with other small facilities but they could presumably have been more economical considering the excessive costs in the sewage component, the building freeze imposed by the municipality and the (foreseeable) very limited effectiveness of the complementary measure. According to earlier reports, water losses would still appear to be very high at an estimated 60%. The collection efficiency in Dalyan is good at 95%, but unsatisfactory in Köycegiz at 65%. The capacity utilisation of the treatment plants is unsatisfactory but is still acceptable in Dalyan due to the peaks in the tourist season. The landfill was set up for an original planning horizon of up to 2014, and to 2020 accounting for delays. There is a risk that landfill capacity will be exhausted beforehand due to the waste handled from other areas. Possible synergies through the construction of similar sewage plants at two locations were not harnessed due to the allocation of operating tasks to a special-purpose association and the municipalities. The total fees levied by the municipalities for water and sewage only just meet the estimated dynamic operating costs (104% operating cost recovery). Cost recovery surpluses are also earned in the waste component but total costs are not covered. Altogether, we classify efficiency as insufficient (Subrating 4) due to the unsatisfactory production efficiency of the measures.

For the most part, the water quality in the lake and in the wetlands meets the parameters of Water Quality I or II. Specified at < 4 mg BSB5/l, the aim was to meet Water Quality I at project appraisal. No information is available for this figure and water quality grading is also defined differently today. According to the environmental authority, EPASA, water quality in the lake has improved considerably. Its pollution has been definitely reduced through the reduction of effluent inflows, although diffuse foodstuffs are still discharged into the water system from farming, fishing and boat traffic. Altogether, the overall environmental objective was achieved with minor reservations. Beneficial health impacts have been achieved according to EPASA, although this could not be verified with figures. Since drinking water quality is, however, safe we may plausibly assume positive health impacts. Altogether, the overall objective has been achieved, with slight reservations. The intended side effect of maintaining tourism as a source of income was also achieved by the measures. Altogether, we therefore gauge the overarching developmental impacts of the project as good (Subrating 2).

The marginal dynamic operating cost recovery poses a risk for the sustainable operation of the facilities. Furthermore, delays in repairing the sewage plant in Dalyan indicate that the municipalities do not attach priority to sewage disposal. In view of the foreseeable exhaustion of the landfill, the lack of revenue for the extension of the facility (inadequate fees for full cost recovery) and the handling of refuse from locations outside the project area, we also see the sustainability of the waste component at risk. The municipalities can, however, apply for subsidies for investments in waste disposal of 45% of investment costs from the Environment Ministry. The impending adoption of the implementing regulations for the Environmental Law will also lay the foundation for raising waste disposal tariffs in order to recover costs in full, so that there is reason to expect an improvement in the general conditions in this sector in future. The strategy of a special-purpose association was not fully implemented due to the unwillingness of the municipalities, particularly Dalyan, to surrender tasks to it. It is also uncertain how far the special-purpose association will be able to assure the operation of the various facilities in future. We therefore consider sustainability to be satisfactory (Subrating 3), because the developmental efficacy of the project so far is likely to decline while still remaining positive.

Weighing up the above assessments, we attest the project satisfactory developmental efficacy overall (Subrating 3).

General conclusions

From the outset, the complex and cumbersome institutional project setup was beset with high risks. These were also identified and an attempt was made to cope with them through conditionalities, implementation agreements and recommendations as well as a complementary measure. From today's standpoint, despite considerable efforts the project did not succeed in setting up a long-term integrated special-purpose association for water supply and sanitation as a means of reducing risks. We therefore draw the following conclusions:

Measures to set up/develop institutions can only succeed if they have the political backing of all stakeholders. Commitments obtained under pressure - here: consent to a special-purpose association scheme as a requirement for signing a financing agreement - may well prove to be unsustainable and can be rescinded by the partners. We recommend making a careful and realistic assessment of stakeholder interests.

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:

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| 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 an 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).