Ex post evaluation – Palestinian territories

Sector: 14020 Water supply and sanitation - large systems
Project: Tulkarem water supply BMZ No. 1998 65 445*
BMZ No. 1930 01 922 (training component)
Implementing agency: Tulkarem Municipality/Water and Sewage Department

Ex post evaluation report: 2017

		(Planned)	(Actual)
Investment costs (total)	EUR million	7.16	10.96
Counterpart contribution	EUR million	0.72	1.10
Funding	EUR million	6.44	9.86
of which BMZ budget funds	EUR million	6.44	9.86
Training component	EUR million	0.30	0.30
of which BMZ budget funds	EUR million	0.30	0.30

*) Random sample 2015

Summary: The project set out to improve the water supply systems in the city of Tulkarem in the Palestinian territories' West Bank. This included constructing buildings for operations and storage, rehabilitating and restructuring the distribution network, installing new pipelines and pumping stations, rehabilitating wells and building new wells, rehabilitating reservoirs, and delivering electromechanical machinery. These measures were accompanied by a complementary measure to train the executing agency's staff in commercial and technical departments.

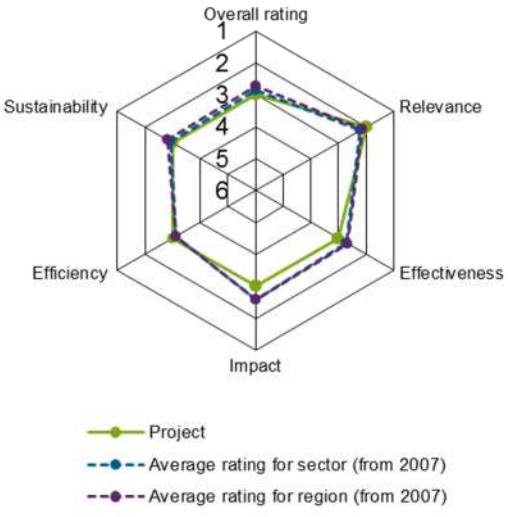
Development objectives: The ultimate development policy objective (impact) of the project was to contribute to saving scarce water resources, decreasing the health hazards, and improving the living conditions of the population. Economically efficient supply and use of hygienic drinking water, to be accomplished by reducing technical and non-technical unaccounted for water (UfW) in Tulkarem's distribution network, were defined as the project objective (outcome).

Target group: The target group was the population living in the city of Tulkarem, including the inhabitants of two refugee camps (currently around 80,000-100,000 people in total).

Overall rating: 3

Rationale: The project has been decisive in helping to ensure that clean water is available to the target group around the clock. It also contributed to conserving scarce water resources, even though it is not possible to establish the exact amount saved on account of the data situation. However, the objectives were only achieved in part. For instance, the implementing agency still cannot cover its running costs with its revenues and the UfW rate is above the intended target level. In light of the project's general circumstances, the results achieved are satisfactory.

Highlights: Two trends are apparent. Firstly, there are problems that persist, such as with the high number of leaks registered each day in the supply system, which are primarily accounted for by the old network that was unaffected by the project. Secondly, on the other hand, the executing agency is actively addressing certain problems, for instance in raising the collection rate and gradually reducing old accounts receivable from accumulated water bills. The project was designed to be sensitive to the possibility of conflict and helped to prevent potential conflicts over water resources by improving the water supply.



Rating according to DAC criteria

Overall rating: 3

Ratings:

Relevance	2
Effectiveness	3
Efficiency	3
Impact	3
Sustainability	3

Relevance

Water shortages seriously limit the development of the Palestinian territories, affecting every area of social and economic life. There is a fundamental conflict between Israel and the Palestinian territories over the distribution of the scarce water resources in the region. Palestinian administrative bodies can only tap into new water resources, such as wells, after obtaining Israeli authorisation. The approval process is lengthy and very often the Israeli authorities decide to refuse permission.

The water shortages are particularly critical during the summer months in Tulkarem, located in the northwest of the Palestinian West Bank. The programme aimed to conserve scarce water resources and increase availability, while simultaneously reducing health risks to the population and improving living conditions. The objective and the results framework behind the project make clear sense, even though there were no indications of a health hazard to the population existing from drinking water. It was rather a case of preventing a possible future risk of this type. The core problem was addressed. An enhanced focus on rehabilitating the well installations (specifically on increasing the yield and the efficiency of the electric motors and pumps) would have been beneficial as a means of decreasing the system's vulnerability and increasing the project impacts. There was a sewage system present in Tulkarem, which was supported in parallel by a KfW-financed project.

The project was designed to be sensitive to the possibility of conflict in that it focused on rehabilitating existing well components, so did not explicitly target an increase in yield. There were already approvals and acceptance from the Israeli side for the existing wells' use. With the measures to improve the water supply, the project was within a focus area for Financial Cooperation (FC) in the Palestinian territories. Technical Cooperation (TC) supported the project executing agency with tariff-related issues. The project measure in the city of Tulkarem followed on from United Nations Development Programme (UNDP) measures focusing on improvements to the water transportation and distribution systems.

In summary, the project's relevance is rated as good from today's perspective.

Relevance rating: 2

Effectiveness

The project objective was to achieve economically efficient supply and use of a sufficient volume of safe drinking water, primarily by reducing technical and non-technical unaccounted for water (UfW). The resulting investment measures were accompanied by comprehensive training courses for the technical and commercial departments of the water supplier in Tulkarem. The reduction in technical and non-technical UfW to 30% which was intended at the start of the project (Indicator 1) was not accomplished. These levels currently stand between 35% and 38%, albeit in the context of a doubling in the number of customers and an expanded network. Figures for UfW fluctuate from month to month (29% to 53%). The situation in the two refugee camps must also be taken into account: the project executing agency does not have any information about the total volume of water delivered to these two camps (around 20,000 residents or 25% of the population). Water meters are far from being widely installed in the refugee camps, meaning

that water is billed to a very low degree in the instance of the camps, though these are not paid for in any case, as refugees do not need to pay for their water consumption according to a Palestinian National Authority decree. The numbers therefore only have limited meaning at present. This is also true for Indicator 2 ("collection rate"). The current figure for this is 62%, with the population in the refugee camps settling their water bills either rarely or not at all. The indicators pertain to Tulkarem's supply area, including the refugee camps.

Indicator	Status and target value PA	Ex post evaluation
(1) Reduction of UfW	Status PA: 48% Target value: 30%	35%-38% (estimate)
(2) Increase in the collection rate	Status PA: 45% Target value: 80%	62% (see also "Efficiency" section)
(3) Evidence of residual chlorine concentration can be provided	Status PA: no data Target value: 80% of all water samples	95%
(4) Continuity of water supply	Status PA: no data Target value: 24 hours, minimum 1 bar of pressure	24 hours, minimum 1 bar of pressure

Indicator 3 regarding water quality was achieved, with the water quality not posing any significant problem, including at the time of the programme appraisal, according to the information provided. At the time of the evaluation, the quality of the drinking water was suitably monitored by the executing agency's laboratory. The measures were targeted more at reducing the system's vulnerability in this regard (residual chlorine concentration as proxy indicator). In a short survey of water users (not representative), respondents made consistent acknowledgement of an improved supply (quantity, reliability). The consumers also appeared to be satisfied with the water quality. It was possible during the evaluation mission to confirm a significant, consistent supply reliability (24 hours, 1 bar of pressure), which is remarkable in the context of the Palestinian territories. The population has increased from 70,000 to 100,000 compared with the time of the programme appraisal (statistics differ). Water production has doubled, as has the length of the network.

The mission could not confirm that pressure zones were set up as part of the network restructuring. In the face of explicit demand, the executing agency has insisted on asserting that no pressure zones were set up in Tulkarem, though this is described in various documents (project template, Final Report). The differences in altitude within the supply area (around 70m maximum) do not necessitate the set-up of pressure zones. Dividing the area into various district metering areas (DMAs), on the other hand, would have facilitated more precise measurement of supply and consumption levels, making it easier to locate leaks.

The daily number of larger-scale pipe bursts (10-15) has not changed, meaning that it continues to be extraordinarily high. This indicates that technical UfW was only reduced a little and improvements in the NRW[1] level were primarily accomplished by reducing administrative losses.

A total of 19 training measures were conducted, covering key areas of technical and commercial management and operations. The executing agency's claims about the effectiveness of the training sessions were not entirely convincing, as various executing agency employees were scarcely able (despite repeated follow-up inquiries about the training sessions) to name specific instances of training or course content which they have supported and continue to use in their everyday work. Overall, the training on leak detection in particular appears to have made an impact. The water supplier has staff that can respond quickly to

[1] Non-revenue water

the population's reports, pinpointing and fixing the reported leaks. However, the staff do not currently perform systematic leak detection. Debt collection also seems to have improved as a result of the training measures. For instance, the executing agency has established a system whereby employees read the domestic water meters and forward the information to the staff responsible at the WAT office, where they are digitally recorded in a central location and used to prepare the bill.

Only some of the target values were achieved in terms of the administrative performance indicators, although the executing agency's performance capacity and the supply situation were both significantly improved overall under difficult circumstances. In view of this situation, the project effectiveness is assessed as satisfactory. The positive trend in terms of the executing agency performance, which was also assisted by the significant tariff rise, is especially manifest in the shorter response time between when a defect is reported and when it is remedied, in addition to various measures to increase the collection rate and reduce debts.

Effectiveness rating: 3

Efficiency

The FC funds required increased from EUR 6.7 million to EUR 9.6 million (including training measures), primarily due to a heavily prolonged project term (from the planned 39 months to 129 months). Given the difficult working conditions (Second Intifada; see below), the resident-based (specific) costs rose from the planned EUR 80 to EUR 120, which seems acceptable when compared with other projects.

Tariffs in Tulkarem were almost tripled between 1998 and 2017 from NIS 1/m^3 to an average of NIS 2.5 to 3.0/m^3 on a tiered rate schedule. GIZ has supported the executing agency with designing the tariffs more economically efficiently since 2010. But there have only been concrete developments in this regard in the last few years. The tariffs are now tiered according to consumption and customer type (normal house connection, industry, tourism). The consumption-based increasing block pricing model charges NIS 2.5/m^3 for 0 to 5m^3, progressing to the top rate of NIS 4/m^3 for 30m^3 and above. A brief consumption survey found that the consumers can cover the higher tariffs from their incomes and are not unduly burdened, as they pay around EUR 16 a month for an eight-person household. This burden is equivalent to about 4% of the average income per household in Tulkarem estimated for 2016. The tariff increase theoretically makes it possible to achieve cost-covering operation. The production costs calculated for the water supply (excluding depreciation – around NIS 3/m^3) show that the current water tariffs are for the most part capable of covering the maintenance and operating costs. However, the proportion of water that is actually billed for only comes to around 65% of the volume produced. The project executing agency is aware of this issue and is actively working on a solution.

The collection rate acts as an indicator for the project's appreciation from the target group's perspective and, in turn, for the allocation efficiency – this moved in a positive direction from 45% at the programme appraisal to 62% in 2017. Nonetheless, there is still a need for improvement on this point, since the executing agency only generates revenue from 40% of the water volume produced, due to the UfW levels paired with the comparatively low collection rate.

The municipality's political will to implement further tariff increases will be decisive for whether they occur. The population in the refugee camps, where between 20,000 and 30,000 people live according to varying sources, does not pay for its water consumption.

The supplier has reported a constant increase in water meter installations. In 2017, by May, it had installed 360 new meters. This number is expected to have increased to 1,000 by the end of the year. Hardly any newly acquired meters seem to have been fitted in the previous years, on the other hand. The meters now due to be set up are to come from the inventory procured in the course of the project.

The implementation's production efficiency is rated as positive. The cost increases, due to factors including the prolonged project term, are still limited in scope when one considers the circumstances in the Palestinian territories in general and during the Second Intifada (2000-2005) in particular. The target group, as far as can be gleaned from the brief surveys, is satisfied with the quantity and quality of the water supply, as well as the executing agency's services. A further reduction in technical UfW would not have been achievable without substantial additional investments. The allocation efficiency is therefore also rated as

positive – a process which by necessity must take the supply provided to the two refugee camps into account.

In summary, we rate the efficiency as satisfactory.

Efficiency rating: 3

Impact

The overarching development objective, as defined during the programme appraisal, was to conserve scarce water resources and reduce health risks to the population. From today's perspective, this goal must be expanded to include the general improvement of living conditions for the target group. No specific indicators that reflect the overarching programme objective were formulated. Instead, the project-specific indicators were considered meaningful enough to evaluate whether the overarching development objectives were achieved. The project has been decisive in helping to ensure that the target group now has hygienic and safe drinking water at their disposal around the clock. In the brief user surveys, the respondents noted that they do not associate the drinking water with any health problems. Due to the evaluation mission's limited time frame, however, it was not possible to supplement this observation with interviews in hospitals and the two refugee camps. The project has also contributed to more sparing use of the scarce water resources. Yet the data available is not sufficient to fully clarify the extent to which the resources could be conserved in this way. The programme appraisal assumed UfW levels in Tulkarem between 47% and 54% between 1995 and 1997. The rate is most likely significantly lower today – between 35% and 38%, according to statistics from the executing agency (total UfW). In any case, the target level (30%) was not reached.

As far as is possible to discern, the project has at the very least not intensified the conflicts surrounding water as a resource between Israel and the Palestinian territories on an overarching level, and in Tulkarem more specifically. In this respect, its implementation was sensitive to the possibility of conflict. In the meantime, the conflict continues unabated. The project did not expressly aim to increase the wells' yields, though this did come as a consequence of the rehabilitation work. The better water supply provided to the Palestinian population at least managed to reduce the conflict's explosive nature from a Palestinian point of view. The increased water provision also helped to prevent a conflict over distribution between the pre-existing population and Palestinian Arab refugees or their descendants (background: the 1946-1948 Palestine War and 1967 Six-Day War). The fact that the refugees in the two camps do not pay for their water consumption is favoured politically and also seems to be overwhelmingly accepted among the tariff-paying population. Requiring payment from the refugees would not only contradict the official stated policy of the Palestinian National Authority, but would also be likely to lead to conflicts in Tulkarem.

In summary, we still rate the impact as satisfactory.

Impact rating: 3

Sustainability

In 1998, the Tulkarem water supplier employed 39 people, rising to 122 as of 2017. The supplier delivered water to 8,700 households in 1998, since which time around 15,000 customers have registered. The labour intensity has grown from 4.5 employees per 1,000 house connections to a relatively high 8.1 employees at present. The Geographic Information System (GIS) that was introduced is in use and undergoing an operational expansion to guarantee an overview of Tulkarem's available water network. Yet use of the GIS system could be optimised, for instance by deploying it to systematically rehabilitate old parts of the network or perform systematic leak detection. Water meter readings are analysed and "anomalies" are investigated. However, the water meters are not calibrated and remain in the system as long as they are operational, which can result in imprecision when reading them and establishing the water volume due to be billed.

The quality of the infrastructure financed via the project is good. No complaints were identified or reported with regard to defects. The installations are in good condition on average. The executing agency has not provided any information about whether they undergo systematic maintenance. There is an operational routine in place which includes particular maintenance functions and the water quality checks. The project

executing agency states that it carries out up to 600 repairs each month, with around ten of these each day being more serious in nature. As such, this high number is virtually unchanged in comparison with the situation during the programme appraisal. The main problems today primarily exist in older parts of the network that were not a focus of the project's rehabilitation measures. Leaks are fixed as soon as they are reported by the customers. The executing agency does not actively search for the leaks, although it has helpful tools at its disposal in the form of the GIS, the training given, and the SCADA system. The SCADA system is functional and measures all necessary operational parameters (pump, reservoirs, wells, valves) at the production centres, storage reservoirs, etc.

Against this background, the supplier still cannot cover its running costs with its revenues. Each year, revenues amount to around NIS 7 million, whereas expenses come to NIS 9 million for running costs. The municipality makes up the balance. This is a common occurrence in the Palestinian territories. Therefore the assumption is that this subsidy arrangement will endure into the future, as was confirmed locally in the discussions. The supplier has taken active measures to motivate the customers to pay their monthly bills. For instance, payment of their water bill has been linked to their power supply. If consumers do not pay their water bill, their power is disconnected until the water bill has been settled. In addition, the supplier has agreed with customers to settle old debts (worth, for example, NIS 100 per month) with the monthly water bills. This is intended to reduce accounts receivable (currently to the tune of NIS 80 million, or around EUR 20 million).

In summary, we must classify the sustainability as satisfactory. This highlights two important aspects. On the one hand, there are positive developments and active steps from the executing agency, in particular to increase its own financial performance capacity. On the other hand, the executing agency remains in a poor economic situation, causing its operations only to be sustainable in their current size and scope with the support of financial contributions from the city.

Sustainability rating: 3

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

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

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

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

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 is very unlikely to improve. 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. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).