

# Ex post evaluation

## Sewerage Project Nablus-West, Palestine

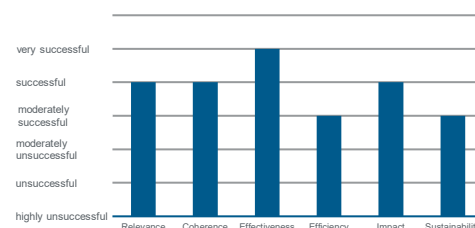
<b>Title</b>	Sewerage Project Nablus-West		
<b>Sector and CRS code</b>	14020 Water supply and sanitation – large systems		
<b>Project number</b>	1997 65 322 (Inv.), 1997 70 082 (CM 1) and 2015 70 407 (CM 2)		
<b>Commissioned by</b>	Federal Ministry for Economic Cooperation and Development (BMZ)		
<b>Recipient/Project-executing agency</b>	City of Nablus, Water Supply and Sanitation Department		
<b>Project volume/ Financing instrument</b>	EUR 47.7 million FC contribution (inv.), EUR 1.5 million (CM 1) and EUR 0.9 million (CM 2), all grants		
<b>Project duration</b>	1997–2017		
<b>Year of report</b>	2023	<b>Year of random sample</b>	2020

### Objectives and project outline

The objective at outcome level was to ensure environmentally and health-friendly waste water disposal in the western part of the city of Nablus and the upper reaches of the Wadi Zeimar.

The impact objectives were to contribute to the protection of regional water resources and thus also indirectly to protecting the health of the population.

Overall rating:  
**successful**



### Key findings

The project achieved a high level of development effectiveness. The project has been rated “successful” for the following reasons:

- The core problem of the threat to the region’s scarce water resources caused by the discharge of untreated waste water into the Wadi Zeimar had been correctly recognised, and suitable measures were identified.
- Nablus and the neighbouring towns are located on the western aquifer, which serves as a water source for both Palestinian and Israeli villages. Protecting this water source from contamination by urban waste water therefore also has nationwide conflict-reducing importance.
- The waste water treatment plant shows positive purification capacity with regard to the reduction of biological oxygen demand and solids content. The good quality of the discharged water from the waste water treatment plant, including unintended nitrogen removal, enables agricultural use of the treated waste water.
- Although only around 60% of the operating costs can be covered due to the very low waste water tariffs and insufficient collection rate, the motivated staff of the waste water treatment plant make every effort to ensure economically optimal operation.
- In view of its impacts beyond the city of Nablus, the project is an important part of the FC portfolio’s integrated water management concept in the northern part of the West Bank

### Conclusions

- In view of the low operating cost coverage and hardly any increase in revenues, the financial integration of sewage treatment plant operation into the budget of the city of Nablus is the only functioning yet only partially sustainable solution.
- The inclusion of energy-generating and energy-efficient measures in such projects is a good way to improve the operating balance sheet.
- The operator shows good approaches to preventive maintenance and the sustainability of the entire waste water system. The practice of insuring the most important process systems by the city of Nablus has reproducible

## Ex post evaluation – rating according to OECD-DAC criteria

### General conditions and classification of the project

The evaluation addressed the target achievement and impacts of the “Sewerage Project Nablus-West” (BMZ no. 1997 65 322) and the associated complementary measures (BMZ no. 1997 70 082 and 2015 70 407). The city of Nablus lies in a narrow valley between the Ebal and Gerizim mountains in the northern part of the West Bank. Rapid population growth and uncontrolled urbanisation further increased the already existing water deficit in the region. Over the last 30 years, the population living in the Palestinian Territories has grown by approximately 150%. In the city of Nablus, the population rose from approx. 100,000 in 1997 to approx. 190,000 (2021) with a growth forecast of approx. 260,000 by 2030. Due to urbanisation and intensive agriculture, the water quality of aquifer was exposed to high risks. The untreated discharge of waste water in particular posed a significant threat to the quality of the underground water supply – and thus also to the health of the population.

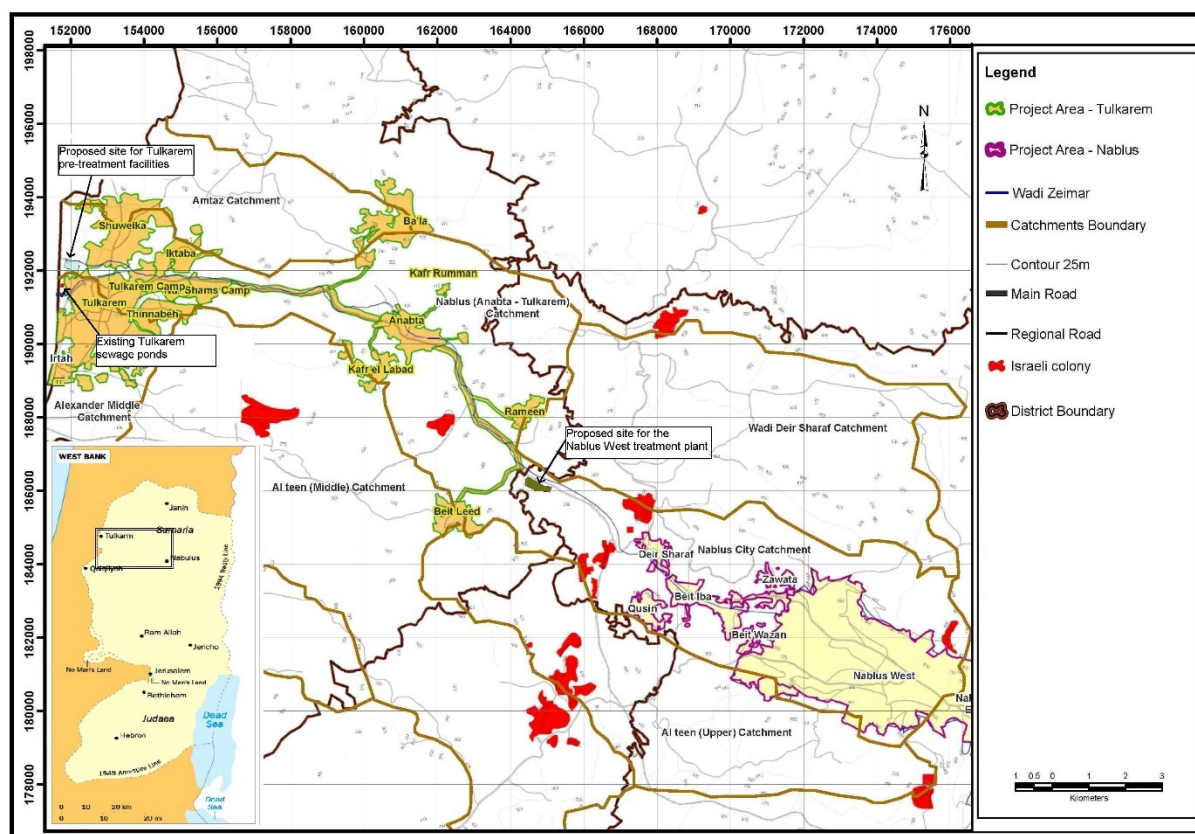
The project is closely related to the projects “Water Loss Reduction Nablus I” (BMZ No. 1999 65 252) and “Water Loss Reduction Nablus II” (BMZ No. 2006 66 479), which improved the efficiency of the water supply. It was implemented as a cooperation programme with TC. The evaluation took place under difficult security conditions in the project area.

### Brief description of the project

In order to clear the residential waste water from the western part of the city of Nablus and the surrounding villages before discharge to the Wadi Zeimar and thus reduce the risk of contamination of the western aquifer, a waste water treatment plant was built for the treatment of approx. 14,000m<sup>3</sup> of waste water intake per day, a main collector was built from the city border to the waste water treatment plant, the sewer network in Nablus was expanded and new ones were built in two additional villages.

The complementary measures ensured the operation of the waste water treatment plant for up to four years after completion and enabled the staff to operate the waste water treatment plant technically and economically. As part of the complementary measure, an environmental control unit was set up in the municipality of Nablus to monitor industrial waste water along the Wadi Zeimar. The project’s direct target group was approx. 152,000 inhabitants of Nablus and the villages on the upper reaches of the Wadi Zeimar. In a broader sense, the project benefits residents throughout the Wadi Zeimar catchment area, including parts of the Israeli population who depend on the water supply from the western aquifer. The executing agency was the water and waste water department of the city of Nablus. The project’s assessment was made based on a limited sustainability requirement with regard to covering operating costs through fee revenue; diminishing co-financing of running costs over three years was made from FC funds as part of the complementary measure (BMZ no.1997 70 082).

### Map/satellite image of the project country including project areas/locations



Source: KfW Change-Appraisal Report 2008

### Breakdown of total costs

	Inv. (planned)	Inv. (actual)	Complemen- tary measure 1997 70 082 (planned)	Comple- mentary measure 1997 70 082 (actual)	Comple- mentary measure 2015 70 407 (planned)	Comple- mentary measure 2015 70 407 (actual)
<b>Total costs in EUR million</b>	22.8	49.1	0.4	1.5	1.5	0.9
Counterpart contribution EUR million	2.4	2.1				
Debt financing EUR million	20.4	47.0	0.4	1.5	1.5	0.9
<i>Of which budget funds EUR million</i>	20.4	47.0	0.4	1.5	1.5	0.9

*NB: The total costs cannot yet be fully recorded during the ex post evaluation (EPE), as the FC funds have not yet been fully disbursed. The current financing corresponds to the funds disbursed by the EPE. The responsible sector team agreed to report on the final costs and FC funds used when the project was reported to the Federal Ministry for Economic Cooperation and Development (BMZ) at the latest.*

## Rating according to OECD-DAC criteria

### Relevance

#### *Policy and priority focus*

The Palestinian Territories (West Bank and Gaza Strip) are among the countries with the lowest reserves of renewable water worldwide. The predominantly arid and semi-arid climate conditions with very low precipitation values – especially in summer – limit the replenishment of ground water aquifers, which are responsible for approx. 90% of the total water supply in the Palestinian Territories. The forecasts for climate change indicate that water availability will continue to decrease due to the reduction in rainfall. As a result, this will lead to reduced ground water recharge.

The city of Nablus is nestled in a narrow valley between Mount Ebal and Mount Garizim in the northern part of the West Bank. The back of the valley runs through the city centre and forms the watershed between the Mediterranean and Jordan Valley, dividing the urban area into two almost equal drainage areas. The western part of the city drains into the Wadi Zeimar, which flows into the Alexander River in Israel. The eastern part of the city drains into the Wadi Sajour, which continues to the Jordan Valley.

The long-standing Israeli-Palestinian conflict determines the population's access to resources. Access to water in the West Bank has been restricted since the war in 1967, when Israel took full control of the local water resources. The Oslo II Accord of 1995 granted Palestinians in the West Bank restricted water access rights. In Article 40 of this agreement, it was decided that a Joint Water Committee (JWC) would be established to deal with all water and waste water matters in the West Bank and coordinate and monitor the management of the common aquifers. However, this committee met irregularly and resumed operations for the first time at the beginning of this year after several years' break. Of the estimated 679 million m<sup>3</sup> of renewable water resources in the aquifers in the West Bank each year, only around 17%, or 118 million m<sup>3</sup> respectively, are allocated to the West Bank (the remaining 83% to Israel), of which around 75%, i.e. 90 million m<sup>3</sup>, are used for agriculture each year.

The quality of the water in the common mountain aquifers between the West Bank and Israel was severely impaired during the project appraisal in 1997, not only due to the untreated discharge of household and industrial waste water, but also due to unregulated waste disposal and incorrect agricultural practices. The western part of the city of Nablus and the villages in the upper reaches of the Wadi Zeimar drained into the Wadi Zeimar. A large proportion of the waste water infiltrated in the soil before the project began and thus jeopardised the quality of the water supplies. The discharge of untreated waste water into the Wadi Zeimar to Israel was a cross-border challenge, so Israel paid for the clarification of waste water from the Palestinian Territories by the Palestinian Water Authority. The Israeli Water Authority issued confusing invoices for this; it is not possible to understand what the basis of calculation for the invoice was. There are no measuring stations for recording the waste water flowing over the green line. Furthermore, the Israeli water authority also often charges for waste water that has already been treated in Palestine, which flows over the green line (border with Israel). This represents a double cost burden for the Palestinian side. The water authority's rationale is that the Palestinian waste water treatment plants only use two treatment stages (without disinfection/UV treatment), although this is also the case in the majority of Israel, and the treated water is harmless to the environment. Further treatment in Israel is therefore not necessary from our point of view after treatment in a Palestinian waste water treatment plant with two treatment stages. Untreated waste water from the Israeli settlements in the West Bank is an equally disputed issue. Israel is also claiming payments from the Palestinian Authority for this purpose.

The project was conceived after the signing of the Oslo II Agreement in 1995, in a situation characterised by optimism about possible recognition of the Palestinian state and a peaceful future. Master plans were drawn up and studies developed to make investments in the water sector. The Palestinian authorities prioritised the protection of existing water supplies and the development of new water sources (up to the limited extraction volumes set forth in the Oslo II Agreement, see above). The project was in line with the Palestinian objectives in terms of waste water treatment and reuse for the efficient use of existing water resources. Even though this had not yet played a role at the time of the project appraisal, the conservation of water supplies is now of central importance in view of climate change in the Middle East region.

The waste water from the western part of the city of Nablus was discharged into the upper reaches of the Wadi Zeimar. As a result, the Wadi had become a sewer, which affected the quality of ground water resources and the health of local residents. A high proportion of the waste water infiltrated the limestone in the underground

formations and jeopardised the ground water resources of the aquifers, which were the main water supply source for the governorate of Nablus and the neighbouring Israeli regions. At the same time, the Wadi Zeimar was used extensively for irrigation purposes before the implementation of this project, which led to the risk of contamination of the entire food chain. The population often complained of bad odours and plagues of insects.

The water situation in the Wadi Zeimar was a persistent issue of conflict between Israel and the Palestinian authorities because the Wadi Zeimar led to the Alexander River behind the state border to Israel and crossed Israeli nature reserves. Israel charged the Palestinian Authority for the costs of treating the untreated waste water flowing to Israel. Therefore, the Palestinian Water Authority's goal was to reduce the amount of untreated water flowing to Israel and to save the associated costs by building central waste water treatment plants.

By conserving ground water resources and thus ensuring proper water quality in the long term, vulnerable population groups who are barely able to buy drinking water and depend on the central water supply benefit the most. The high connection rate to the waste water network (95%), which already existed before the project, also applied to disadvantaged population groups in the more low-lying part of the city and the refugee camp in the western part of the city (Ein Beit Alma). No specific impact on disadvantaged groups or on gender equality can be determined.

Expanding water availability remains the absolute priority of the city of Nablus. The operating staff of the waste water treatment plant asked the evaluation mission to convey the importance of the waste water treatment plant to the newly elected city politicians. Our impression was that only a few people with specific expertise were familiar with the link between aquifer quality and sewage treatment. In point of fact, appreciation for the project was based on other factors, such as the treatment of surface water, improvement of municipal hygiene and reuse of treated waste water for agriculture.

The anticipated reduction in payments to Israel by treating waste water in the Palestinian Territories did not occur.

### ***Appropriateness of design***

The importance of environmentally and health-friendly waste water disposal and clarification for the conservation of cross-border water supplies in the western aquifer was correctly recognised during the project appraisal in 1997. Suitable measures were identified with the expansion of the sewer network and the construction of a waste water treatment plant for approx. 152,000 inhabitants in the western part of the city of Nablus and in the upper reaches of the Wadi Zeimar. From a technical point of view, separate waste water disposal in Nablus-West and Nablus-East was the right decision because the western and eastern parts of the city drain into different aquifers. The project was well prepared, and the executing agency, the water and waste water department of the city of Nablus, was involved in all processes. The project was discussed in the Joint Water Committee (JWC) between Israel and Palestine. The treatment plant was built in Zone C, which is under Israeli military and administrative control, and in which each infrastructure measure requires a permit from the JWC and the Israeli civil administration. A thorough consultation process with all parties involved preceded the necessary adjustments with regard to the technology of the waste water treatment plant, which were presented in the change-audit report of 2008.

The aim of the project was to ensure that the health- and environmentally friendly waste water disposal of the city of Nablus and the upper reaches of the Wadi Zeimar would contribute to the protection of surface water and ground water. Proper treatment of waste water would decrease infiltration of untreated waste water into aquifers and reduce the risk of ground water contamination. This would ensure a hygienic water supply for the regional population in the long-term. The complementary measures were designed to ensure the technical operation of the waste water treatment plant and to establish an environmental control centre in the city of Nablus. This impact chain is also plausible from today's perspective. No indicators were defined at the time of the project appraisal for the development policy objectives (protection of regional water supplies and public health). However, data on ground water quality was provided to the evaluation team on the ground, which are well-suited as proxy impact indicators, as they were collected from a well above the western aquifer.

The project was implemented in an unstable environment characterised by political and military conflicts. Fortunately, all those involved were firmly convinced of the importance of the project and, despite a longer interruption during the second Intifada (the war between Israel and Palestine from 2000–2005), it was carried out successfully.

## *Response to changes/adaptability*

The project covers a 20-year period from 1997 to 2017, from the first appraisal to the completion of the waste water treatment plant. The project's implementation was interrupted in 2000 due to the outbreak of the second Intifada, shortly before finalisation of the award of the construction measures. The building permit process also cost a great deal of time after the second Intifada, and the construction site for the waste water treatment plant had to be adjusted once again.

### *Summary of the rating:*

The approach of reliable waste water disposal through sewer network expansion, collection of waste water in the western part of Nablus and waste water treatment in a central waste water treatment plant is fundamentally correct and contributes to the conservation of limited water supplies. The project responded appropriately in a fragile environment and is in line with the development policy objectives of the partner country. In addition, the project has a conflict-reducing effect by protecting cross-border ground water supplies with Israel.

**Relevance: 2**

## **Coherence**

### *Internal coherence*

The project is divided into a series of FC projects that followed the comprehensive approach of long-term environmental and health protection in the project region. Building up a sustainable water supply and waste water treatment to conserve resources and to protect health in the Palestinian Territories is well integrated into all DC activities. Even though the implementation of the project took around 20 years due to the conflict-ridden environment, it did not lose any of its coherence. In Nablus, TC and FC activities worked closely together. The development and support of the water and waste water department of the city of Nablus as part of the TC project "Water and Sanitation Project Nablus" were a prerequisite for expanding the executing agency's operating capacities, in particular the training of the waste water treatment plant's operating staff as part of the complementary measures of the project. The project is part of DC activities in the Wadi Zeimar catchment area and complements the projects "Tulkarem Regional Sewerage" (BMZ no. 2002 65 397), "Water Loss Reduction Nablus I and II" (BMZ no. 1996 65 252 and 2006 66 479) and "Re-use of Water Nablus" (BMZ no. 2016 87 823). The potential for the latter project was exploited by the pilot measure included in the project in a test area of 2km<sup>2</sup> (reuse of the treated waste water and sewage sludge for agricultural purposes). This project is exemplary, as water reuse in Palestine will play an increasingly important role in the future.

The project is directly related to the SDG agenda, in particular SDG 6 "Ensure availability and sustainable management of water and sanitation for all by 2030".

### *External coherence*

The water sector is highly fragmented with over 300 urban and rural service providers. The executing agency of the project was the city of Nablus, within which the Water Supply and Sanitation Department (WSSD) was in charge of implementing the project. The refugee camps are under the administration of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNWRA), which is also responsible for their connection to the sewer network. With the refugee camps, the city of Nablus already had a high connection rate to the waste water network (95%) before the project was implemented; this was a good starting point for the design and implementation of the subsequent DC measures.

At country level, the Palestinian Water Authority (PWA) and the Water Sector Regulatory Council (WSRC) were the main actors. According to Decree No. (14) for the year 2014 Relating to the Water Law, the PWA was intended to act as a ministry in charge of the sector's political and legislative framework, while WSRC was entrusted with monitoring the sector, setting tariffs and licensing. The project is in line with the objectives of the Palestinian Authority in the water sector, as historically defined in all strategies and plans from 1995 to the present day. In the National Water and waste water Policy and Strategy (2013), adequate sanitation was declared a human right for all citizens of the Palestinian Territories, and the treated waste water was also regarded as a water resource for further use in agriculture. The National Development Plan 2016–2022 set the objective of expanding waste water management (from waste water treatment to waste water reuse). The protection of water

resources – and in particular the protection of water quality in aquifers – has been a top priority in the Palestinian Water Agency’s strategic plan (2016–2018). A new national water and waste water strategy is currently being developed with the support of the Norwegian government, which represents a continuation of the 2013–2016 strategy.

A large number of projects in water supply and waste water disposal have been financed or are currently being implemented in the Palestinian Territories by Germany, France, Japan, the Netherlands, Sweden, the European Union, the United States and the World Bank Group. The water and waste water sector is dependent on external donor financing. The design of the measure and its implementation were carried out in good coordination with the donors, for example within the water sector working group. Germany was the lead donor for this group in the water sector until 2016. Due to the official withdrawal of the German Federal Government from the water sector in Palestine, this role was then transferred to the Dutch representation. In 2016, the Federal Ministry for Economic Cooperation and Development (BMZ) decided to end DC activities in the priority area of water. Since then, no new development cooperation funds have been made available for the water and waste water sector in the West Bank. An opening of the water sector is planned for 2023 under the new management of the Federal Ministry for Economic Cooperation and Development (BMZ).

**Summary of the rating:**

The project is in line with the objectives of DC and the strategic orientations of the Palestinian authorities. It was developed in coordination with the other donors in the sector and at the request of the Palestinian Water Authority (PWA).

**Coherence: 2**

**Effectiveness**

**Achievement of (intended) targets**

The objective of this project at outcome level was environmentally friendly waste water disposal in the western part of the city of Nablus and in the upper reaches of the Wadi Zeimar. This target also remained unchanged in the 2008 change assessment. The target indicators correspond to the standard measurement values for assessing good waste water treatment plant operation. The following indicator had also been defined at the project appraisal in 1997: “Sewer flushing does not cause any sanitation problems”. The 2008 change assessment rightly disregarded this indicator, with the rationale that the problems would not be detectable without extensive measurements. Furthermore, the city’s sewer network was further expanded so that no more waste water overflows could be detected. The agreed indicators were realistic and reflect the current state of knowledge.

From today’s perspective, the evaluation supplements the indicators for the outcome objective with the standard indicator in waste water disposal of the “number of people with new or improved waste water treatment”.

The outcome objective is considered as achieved if the following indicators were met:

Indicator for achieving the objective at outcome level	Status during PA	Target value acc. to PA/EPE	Actual value at final inspection (optional)	Actual value at EPE
(1) Discharge values for the waste water treatment plant	-	< 20 mg BOD5/l	14 mg BOD5/l	9.2 mg BOD5/l, Value is clearly surpassed
(2) Discharge value for the waste water treatment plant (suspended solids)	-	< 30 mg SS/l	28 mg SS/l	9 mg SS/l, Value is clearly surpassed
(3) Number of people with improved or new waste water treatment	0	152,000 inhabitants of Nablus and five villages		152,000 inhabitants of Nablus and five villages in the

		in the upper reaches of the Wadi Zeimar		upper reaches of the Wadi Zeimar
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The waste water treatment plant is based on the activated sludge treatment system with mechanical and biological treatment. The technology used in the sewage treatment plant was adapted during implementation to achieve better operating results. As part of the project, the first phase of the waste water treatment plant, designed for 152,000 people, was implemented. The design would allow for two further expansion phases. The waste water treatment plant was planned for a hydraulic capacity of 14,860 m<sup>3</sup>/day. In 2015, the utilisation of the sewage treatment plant was only 9,394 m<sup>3</sup>/day, while an optimal utilisation according to plan was observed during the on-site evaluation. The increased amount of waste water now fed into the waste water treatment plant is due to the connection of five villages in the governorate of Nablus to the central waste water disposal system, namely Beit Iba, Bayt Wazan, Zawata, Dayr Sharaf and Qusin. However, the currently full hydraulic capacity utilisation is pushing the waste water treatment plant to its capacity limit.

The sewage sludge generated during sewage treatment is further treated, thickened, dried and stabilised in a digester. Since 2017, energy has been generated from the obtained methane gas (CH<sub>4</sub>) in a cogeneration unit, which covers approx. 50% of the energy requirements of the waste water treatment plant. The stabilised sludge is distributed to the surrounding fields.

As part of the first complementary measure (BMZ no. 1997 70 082), the executing agency received support in setting up an environmental monitoring centre, which now checks the waste water discharged from the 20 surrounding businesses. The training of the operating staff was accompanied by both measures in close coordination with the accompanying TC measures to establish the environmental monitoring body, to support the technical and commercial management and to qualify the waste water treatment plant personnel. The contract of the construction consortium (Kinetics – Passavant & Roediger) also included a component for instructing the executing agency in the operation of the waste water treatment plant. This was followed by two years of operational assistance from the consultant Consulaqua from the complementary measure (BMZ no. 2015 70 407). This enabled the executing agency to ensure the operation and maintenance of the sewage treatment plant. The staff of WWTP Nablus West benefited from these measures in the long term, guaranteeing very good operational management to this day. Nablus is regularly consulted with regard to advice and technical support for other treatment plants. For example, the municipality of Nablus also provided advisory support for the start of operation of the Salfit waste water treatment plant as part of the “Salfit waste water disposal” project, BMZ no. 1994 66 004 (commissioning at the beginning of 2022).

### ***Contribution to achieving targets***

The goal of environmentally friendly waste water disposal in Nablus West and in the upper reaches of the Wadi Zeimar was achieved to our complete satisfaction. The waste water treatment plant discharge values found during the evaluation represent the monthly average for the last year from April 2021 to April 2022. The values are significantly below the target values set during the appraisal and can be attributed to the optimisation of waste water treatment plant operation by the specialist personnel during the course of the project. It is noteworthy that the target values of the project appraisal in 2008 were the result of difficult negotiations between Israel and the Palestinian Water Authority, which were agreed with the active involvement of KfW and GIZ in a Memorandum of Understanding in 2006. For a long time, the Israeli side insisted on maintaining much higher standards for discharge values (<10 mg BOD/l and <10 mg SS/l). At that time, these target values were rejected due to the higher operating costs required to achieve them. However, today's actual effluent values even reach the high Israeli standards for sewage treatment. This allows the treated waste water to be used for agricultural purposes, which was tested with positive results in a pilot measure.

During the appraisal, a concept was also developed for the financial motivation of the established businesses along the Wadi Zeimar to pre-treat the waste water before discharge to the sewage treatment plant or to the Wadi Zeimar. This measure could not be carried out during the project's term because the commercial enterprises (stone working, tannery, Tahini producer and olive oil mills) were not prepared to pay 60% of the costs for pre-treatment of the waste water. 40% of the costs were to be provided by the project. However, this pilot measure was transferred to the follow-up project “Sewerage Nablus East” (BMZ no. 2013 66 087) and is now being carried



out under the supervision of the environmental control unit. The counterpart contribution of the commercial enterprises has now been made at different levels.

The population living along the Wadi Zeimar has directly benefited from the improved environmental conditions there. There are no more complaints about unpleasant smells of waste water or insects in the city.

We see another positive effect in the excellent technical capacities of WSSD operating staff, the capacities of which were expanded as part of the project. Their advice is appreciated and their knowledge benefits the waste water sewage treatment plant in the eastern part of Nablus.

### ***Quality of implementation***

During the implementation of the measures, there was solution-oriented cooperation between the executing agency, the implementation consultant and the construction company. Necessary technical adjustments have been made and have had a positive impact on the achievement of the objectives. The entire specialist staff operating the waste water treatment plant had no experience with sewage treatment plants before the implementation of the project and had to be trained from the ground up. This was the key to the good technical operation observed today. The quality of the installed systems and the construction are good. The waste water treatment plant has been in operation since November 2013 and the cogeneration unit since 2017.

### **Unintended consequences (positive or negative)**

The reduction of the total nitrogen content in the waste water discharge to 16 mg/l (EU standard is 50 mg/l) was an unintended positive consequence. This prevents an additional potential risk to the quality of the ground water supply due to nitrogen input.

### ***Summary of the rating:***

Based on the comprehensive target achievement, the over fulfilment of the target indicators and the well-maintained condition of the plants, the effectiveness of the project is rated as very successful by the evaluation mission.

### **Effectiveness: 1**

### **Efficiency**

At the final inspection in 2019, the specific costs of the project were around EUR 260 per person, based on 152,000 people who benefited from safe waste water disposal and treatment. The project benefited from the fact that there was already a high waste water collection rate in the project region before the start of the project and that the existing sewer network had to be expanded by only 2km. At EUR 4.6 million plus both complementary measures (EUR 2.4 million), the consulting costs currently amount to approx. 14% of the total costs and are therefore in the upper range, which is understandable given the long implementation time of the project. In principle, we have a positive opinion with regard to the services of the implementation consultant (Lahmeyer International) and the consultant of the Consulaqua complementary measure, which made a significant contribution to the good operational management of the waste water treatment plant.

The financing requirement of approx. EUR 20.4 million mentioned in the first project appraisal was estimated too low. Due to the increased funding requirements, FC financing was increased to a total of EUR 47.7 million in 2008, 2010 and 2014, of which approx. EUR 47.0 million was disbursed by the time of the evaluation. This means that the financing volume has more than doubled in the 20 years of the project term. The increased funding requirement was due to the long interruption to implementation as a result of the second Intifada and the subsequent invasion of Israel in Nablus in 2002 and the increased construction material costs. The adjustment of the project (development of the environmental control unit, construction of a cogeneration unit on the sewage treatment plant, extended operating assistance) also led to higher costs. The construction of the cogeneration unit was necessary in order to partially reduce the energy costs of the waste water treatment plant's operation by producing its own energy, as a response to the deterioration of the economic and social situation after the second Intifada.

The results of the measures were not achieved within the planned time horizon. The originally planned implementation period of three years has increased more than sixfold to 20 years. The main reason for this was certainly outside the project's sphere of influence. Nevertheless, many construction measures, such as the construction of the pre-treatment facilities for industrial waste water, the connection of two additional villages to the central waste water system or the reception facility for waste water to be transported to the sewage treatment plant by tank lorry, took significantly more time than was plausible. The reception facility for waste water from the decentralised septic tanks planned as part of the project had not yet been completed at the time of evaluation, and a final cost and financing overview for the project is still pending.

### ***Allocation efficiency***

The project has helped to reduce the threat to ground water supplies from the discharge of untreated waste water into the Wadi Zeimar. Once it has taken place, contamination of the western aquifer in the region would only be reversible at a very significant cost and the consequences for the water supply of the population living on both sides of the border would be severe.

With the difficult social and economic situation of the population, especially after the second Intifada, project-related measures were handled sensitively. According to the water sector regulator, collection rates were 56% in 2020, 61% in 2021 and now an estimated 65%. It was not possible to achieve the targeted collection rate of 70%, also due to the lack of solvency and willingness to pay in the affiliated refugee camps, but this was also not an explicit objective of the project (appraisal with limited sustainability requirements). Instead, a separate but very low tariff for the operation and maintenance of the sewage network and the waste water treatment plant amounting to NIS 0.5/m<sup>3</sup> (EUR 0.14) was introduced in 2015, which is added to the water bill for all households and commercial companies, regardless of whether they are connected to the waste water treatment plant or not. It should be noted that currently only the western part of Nablus benefits from sewage disposal, but a percentage of the waste water is also charged in the eastern part of the city.

### ***Summary of the rating:***

The measures were implemented with a major delay (20 years instead of the planned three-year implementation period, of which five were war-related delays from 2000 to 2005). Alternative comparisons were made during their implementation with regard to the technology and operating costs of the waste water treatment plant and the application of the best solutions. The invested plant capacities are currently fully utilised and are operated with the expertise acquired as part of the project. However, the waste water tariffs, which have not been adjusted for years, and the low collection rate of 65% impair efficiency. The collection rate is significantly affected by the fact that no fees can be charged in the refugee camps. Overall, we rate the efficiency of the project as moderately successful.

**Efficiency: 3**

## **Impact**

### ***Overarching developmental changes (intended)***

From today's perspective, the project's developmental objective of contributing to the protection of regional water supplies is still valid. Compared to the project appraisal in 1997, the change appraisal report no longer mentioned the objective of reducing health risks for the population in the project region, with the rationale that the positive health impacts of the project would definitely arise in the indirect and long-term. Due to a lack of data, no health-related indicators were defined for the development objective. The effort required to set up a monitoring system to monitor the quality of the aquifer would also be disproportionate from an evaluation perspective, but we still assume that the project has contributed to maintaining the health of the population.

Even though complete data on water quality at the wells were not retroactively available up to the time of the project appraisal, it seems expedient for us to use the water quality data as proxy indicators for this evaluation. Despite several requests, the Palestinian Water Authority was not able to provide the evaluation mission with data on water quality at the wells, but the control department of the city of Nablus regularly collects data at various points in the water supply system and has it analysed at the An-Najah University. In 2021, approx. 700 tests were carried out on the total coliform and faecal coliform bacterial content in the drinking water.

The Deir Sharaf well is one of the city’s most important water supply sources. It uses the water from the western aquifer from a depth of 670m. This well was built using TC financing in 1997. According to the control department, which is in charge of monitoring the drinking water quality in the water and waste water departments of the city of Nablus, significant traces of total coliform and faecal coliform bacteria were regularly detected before the waste water treatment plant was commissioned in 2012.

Analyses in 2021, on the other hand, show that the drinking water extracted at the well in Deir Sharaf is now free of bacteria. The executing agency is of the opinion that the reason for this improvement can solely be attributed to the operation of the Waste Water Treatment Plant Nablus West. The evaluation mission could not clearly demonstrate this. However, it is reasonable to assume that the project also contributed to reducing the health risks of the population at development policy level – in addition to protecting ground water reserves. The head of the health department in Nablus reported to the mission that there are no known cases of water-borne diseases and that the residents of Nablus drink water from the central water supply system. We assume that the facts that the hygienic conditions along the Wadi Zeimar were improved, the use of untreated waste water for irrigation was discontinued and the threat to ground water supplies from untreated waste water were reduced all had an impact on the protection of the health of the population in the project region, even if a clear allocation could not be measured (contribution analysis).

The achievement of the objectives at impact level of contributing to the protection of regional water resources and thus also indirectly contributing to the protection of the population’s health is now summarised as follows:

Indicator	Status 2012	Target value at PA	(Optional) actual value at final inspection	Actual value at EPE
(1) Total coliform bacteria at the Deir Sharaf well	40 cases	....		0 cases
(2) Faecal coliform bacteria at the Deir Sharaf well	60 cases	...		0 cases
(3) Water-borne diseases in the catchment area	n/a			No signs according to the head of the health department

**Contribution to overarching developmental changes (intended)**

The project intended to contribute to the protection of ground water supplies in the project region, which were threatened by the discharge of untreated waste water into surface water, among other things. Regulated waste water discharge and treatment has been achieved for approx. 152,000 residents in the western part of the city of Nablus and in the upper reaches of the Wadi Zeimar. The measures in this project have noticeably improved the sanitary living conditions of the population. The proportion of untreated waste water discharged to the surface water of the Wadi Zeimar has been reduced by approx. 5 million m<sup>3</sup> per year. The people contacted during the mission were consistently satisfied with the fact that the stench and insect plagues in particular no longer occur. The project benefits all residents in the project area, regardless of their social situation.

Even if the use of untreated waste water for irrigation purposes is forbidden, the farmers used this to irrigate their farmland in the lower reaches of the Wadi Zeimar before the project was implemented. The project significantly reduced this threat to the population’s health through the food chain. Nowadays, the waste water is collected in advance and treated in the waste water treatment plant and no longer discharged untreated into the Wadi Zeimar. In the good effluent values of the waste water treatment plant, our interviewees saw potential for large-scale reuse of the treated waste water in agriculture, which is currently being implemented in the follow-up project (Re-use of Water Nablus). The waste water treatment plant also employs an agricultural engineer who deals exclusively with this issue.

There are a few factors that have led to the success of the project. First of all, the will and commitment of those involved to search for and find the best technological solutions for the operation of the waste water treatment plant. Furthermore, the high level of commitment of the local specialists during the implementation of the project and the operation of the waste water treatment plant in a region in which engineers with the required specific expertise for the operation of the waste water treatment plants are rarely found. The technical consultant, operations manager, process manager and SCADA expert have been working since the construction phase of the treatment plant and are proud of what they have achieved. The partners fully acknowledge the contribution of the complementary measures to the training and education of personnel and operational management after completion of the waste water treatment plant. The use of this knowledge accumulated over many years proved to be valuable for follow-up projects in the region (e.g. Sewerage Nablus East, BMZ no. 2013 66 087).

The establishment of the independent environmental control unit in the municipality of Nablus with TC and FC support is also exemplary. It assesses the impact of the waste water from local industry and grants or refuses permits for its connection to the waste water treatment plant. The environmental control unit motivates companies to pre-treat their waste water and closely monitors the implementation of the pre-treatment activities. In the event of a violation, the environmental control unit can charge fines or, in the worst case, order the closure of operations.

In terms of technology and operation, Waste Water Treatment Plant Nablus West is regarded as a successful model by national and international partners and is often visited by delegations. Without this project, the hygienic condition in the upper but above all in the lower reaches of the Wadi Zeimar would have deteriorated even further. The continuous discharge of approx. 5 million m<sup>3</sup> of untreated waste water into the Wadi Zeimar per year would have severely affected the water quality of the western aquifer.

#### **Contribution to impact (unintended)**

This project has developed a wide range of impacts. It was reported to the mission that the substantial improvement in environmental conditions along the Wadi Zeimar and the price increase for the properties located there were due to the impact of this project. In addition, there was an increase in construction activities in the villages around the city of Nablus that were connected to the waste water treatment plant. Younger families, for whom living in the city of Nablus is no longer affordable, are increasingly moving to the villages.

The project had no direct poverty-specific impact. The socially disadvantaged population groups who live in the lower-lying old city of Nablus and in the refugee camp benefited equally from the project.

It is difficult to make clear statements on the impact of the measure on relations between Israel and the Palestinian Authority. Palestinian interlocutors often pointed out that the quality of waste water treatment plays an important role in negotiations between both parties to reduce Israeli payment claims for the Palestinian side. At present, however, the Israeli side has not yet differentiated whether the waste water, which enters Israel across the Green Line, has been treated or not.

#### **Summary of the rating:**

The project made a significant contribution to protecting regional water supplies in the Wadi Zeimar catchment area, and thus indirectly also to protecting the health of the population. We therefore rate the overarching developmental impact as successful.

**Impact: 2**

#### **Sustainability**

For the project, limited sustainability requirements were formulated in the 2008 change review report with regard to a cost coverage, which is not expected to be possible from the fee income. This implied that an economic indicator (e.g. coverage of operating costs) was not tracked. Instead, the ongoing costs of operating the waste water treatment plant as part of the first complementary measure (BMZ no. 1997 70 082) were co-financed progressively from FC funds over three years, with progressive participation by the executing agency. In retrospect, these arrangements were justified if one considers the deterioration of the economic situation as a result of military operations in the years before. Basic infrastructure was partially destroyed, and freedom of movement was restricted by checkpoints and the construction of the Israeli West Bank Barrier. The Palestinian Territories are

highly integrated in and dependent on the Israeli economy. The closure of borders for Palestinian workers and for the movement of goods led to increased unemployment (30% in 2002) – and consequently to an increase in poverty rates.

The change of the sludge drying system from electrical to mechanical dewatering helped to save operating costs and thus contributed to the sustainability of the project. The use of the methane gas produced in the waste water treatment plant for energy production and thus to improve the energy balance, for example, made it possible to cover 76,658kWh of the 115,139kWh of energy consumed in April 2022 with power generated in the cogeneration unit. The operating staff also try to manage the operating processes as economically as possible. Since 2018, the fermentation process in the digester has been successfully combined with the waste from olive oil production. This increases the amount of bio-methane gas produced and generates more energy. The waste water treatment plant can already produce half of the energy it needs itself. In addition to financing the operating materials, the city of Nablus also provides smaller investments for the maintenance of the sewage treatment plant, such as the roofing of the storage facility for the stabilised sludge.

It is noteworthy that the city of Nablus, on the recommendation of the water sector regulatory authority, is extending the service life of the plants financed by the project by insuring them with a local insurance company. This insurance company's representatives monitor the maintenance measures carried out by the sewage treatment plant operator and determine each year which plants can be insured and how high the insurance premium is, which is then to be paid from the budget of the city of Nablus. An annual insurance premium of approx. EUR 100,000 is therefore due for the city's water and waste water department. This additional supervision by the insurance company increases the awareness of the waste water treatment plant personnel to handle the technical operation of the plants responsibly.

As assumed in the change review with limited sustainability requirements, it is not possible to cover operating costs with the very low waste water fees and the currently still low collection rate. At the time of the evaluation, the average collection rate was slightly above 65%, with the collection rate in the city of Nablus itself being 75%, without taking into account the refugee camps and villages outside the jurisdiction of the water and waste water department. Refugee camp residents are considered to be the most socially disadvantaged group in the city and non-payment of water and waste water bills is politically tolerated. In the meeting with the mission, representatives of the refugee camps reported that they were happy with the water and sanitation supply.

The waste water tariff appears on the water bill as a surcharge to the water fees and is invoiced to all households and businesses in Nablus by the water and waste water department of the city of Nablus, whether they are connected to the sewage treatment plant or not. This is justifiable: all residents who produce waste water should contribute to the costs of waste water treatment. Tariff setting follows a fixed procedure and has been approved by the regulator. The basis for the tariff setting is the instructions of the PWA and the urban regulations, which aim to cover full costs including depreciation of the assets. This looks different in reality. Although according to the 2017 decree, regulation tariffs can be adjusted every three years, the waste water fee has not been changed since its introduction in 2015. Indeed, in 2017, the waste water tariff per person was only around 0.1% of per capita income in the West Bank, while 1%–2% is considered acceptable in this sector.

The calculated loss for operating the waste water treatment plant in 2021 was approx. EUR 0.4 million. The fact that the operation of the waste water treatment plant can still be maintained is due to the fact that the budget of the water and waste water department is integrated into the urban budget of Nablus and the operation of the waste water treatment plant is cross-subsidised from this. However, the budget situation of the city of Nablus is very strained. The budget is primarily financed from the income from the energy and water bills as well as from a few municipal taxes, and can only stay afloat if, for example, obligations to the energy supplier are not paid.

The sustainability of the project is therefore subject to several question marks and risks. To secure long-term operation, we see potential in the adjustment of waste water tariffs and the application of the "Polluter Pays" principle – especially for the commercial enterprises in the region. The sewage treatment plant serves to protect regional water supplies, which benefit many more people than just the residents of the city of Nablus.

Even though the reproducible character of the project is appreciated by all parties, its sustainability is also dependent on the unresolved disputed issues in cross-border waste water management. If the Palestinian side does not take financial advantage of the efforts to treat waste water in its own territory, the involvement of the Palestinian Authority may decrease in the long-term. This requires a solution at the political level.

### ***Contribution to supporting sustainable capacities***

The mission was able to determine that the operating facilities are in good technical condition and are being operated properly by the staff of the waste water treatment plant. In addition, the employees of the waste water department of the city of Nablus support the operation of the waste water treatment plant through regular inspections and maintenance work on the sewer network and main sewer lines. The technical staff of the waste water treatment plant, who were trained from the ground up as part of the project, are the basis for the sustainability of the waste water treatment plant's operation. The mission was able to perceive a justified sense of pride in the achievements among the employees. Even though the feared migration did not occur due to better economic prospects abroad, this risk still remains.

Although the waste water treatment plant's operation does not pay for itself financially, the finance department of the water and waste water department of the city of Nablus nevertheless strives to create realistic expenditure plans, which are then submitted to the city council of Nablus for approval on an annual basis. In view of the chronic bottlenecks in the supply of goods and operating resources that are subject to the approval process of the Israeli authorities, the management of the waste water treatment plant tries to report the need for spare parts at a very early stage and secure their financing.

By optimising the internal operating processes, the waste water treatment plant personnel have succeeded in improving the economic efficiency of operation. The joint efforts to optimise the energy balance of the plant as part of the project should be highlighted. By generating energy from biogas incineration in the cogeneration unit, the waste water treatment plant can now cover half of its own energy demand itself. The fermentation of solid waste from olive production in the anaerobic digestion process has led to the expansion of energy production. Additional consumption of approx. 10% is covered by a PV system built later in cooperation with the partner city of Nuremberg. As a result, the operating cost shortfall at the time was reduced from EUR 2.6 million in 2016 to just EUR 0.4 million in 2021.

### ***Durability of impacts over time***

The durability of the measures will depend on how the general political situation in the region develops. Promoting dialogue on cross-border water resource management between Israel and the Palestinian authorities would provide a good basis for securing the sustainability of such projects.

The sustainability of the project could be impacted by the Palestinian Authority's reform plans, which aim to consolidate the sector and reduce the number of operators. According to Decree No.(14) for the year 2014 relating to the Water Law, a national water company was to be established, which was to be responsible for the sale of water to the regional water and waste water suppliers to be established. The aim was that the latter would then be responsible for the water supply and waste water disposal in their regions. So far, these plans have not been implemented. Above all, they failed because the cities are unwilling to hand over their responsibility for the municipal water pipes. They fear that this would result in the loss of one of the few sources of income for the municipal budget. If these reform plans were given new impetus, this would pose a risk to the stability of the waste water treatment plant's operation, as all measures of the project are aimed at the water and waste water department of the city of Nablus.

### ***Summary of the rating:***

Despite the difficult environment and the risks to the financial viability of the waste water treatment plant's operation, the executing agency is making enormous efforts to maintain the operation of the plants, keeping an eye to the future. The project was examined with a limited sustainability requirement with regard to covering operating costs. We rate the sustainability of this project as moderately successful.

**Sustainability: 3**

### **Overall rating: 2**

The project made an essential contribution to protecting regional water supplies – especially in the context of severely restricted water availability. Over its 20-year term, it was subject to major challenges, to which it reacted well and found appropriate solutions. The project-executing agency's efforts to optimise the technical and

economic operation of the waste water treatment plant (e.g. by including the power producing cogeneration unit) are noteworthy, although the financial and security situation in the region continues to be a challenge.

## Contributions to the 2030 Agenda

The project is closely linked to the 2030 Agenda and contributes to the conservation of natural resources for the population in the Wadi Zeimar catchment area. The substantial improvement of waste water disposal and clarification in the project area directly contributes to United Nations Development Goal No. 6: “Ensure availability and sustainable management of water and sanitation for all by 2030”

Specifically, the project contributes to achieving sub-objectives 6.2 (access to sanitation), 6.3 (improvement of water quality), 6.4 (efficient water use and reuse), 6.5 (integrated management of water resources) and 6a (support for developing countries in the area of water harvesting and waste water treatment capacity-building).

To implement this, the project had to build up new structures and capacities that were not available locally at the start of the project for this type of large-scale project with special technical requirements. The project was part of a comprehensive approach to water and waste water management in the Palestinian Territories, which was carried out in close coordination with other local donors.

## Project-specific strengths and weaknesses as well as cross-project conclusions and lessons learned

The project had the following strengths and weaknesses in particular:

The project was implemented in a conflict-ridden environment and has proven to be highly adaptable to local challenges.

Good integration into the country’s strategies has promoted the significance of the project among local authorities.

The professional operation and proactive maintenance of the waste water system have a spill-over effect.

Energy generation and the efforts of the waste water treatment plant operator to optimise the energy balance are impressive. Around half of the required energy is already generated by the sewage treatment plant itself.

The construction of the municipal environmental control unit was a suitable measure to prevent uncontrolled discharge of industrial waste water into ground water.

The complementary measure to support the operation of the waste water treatment plant after its completion was beneficial. However, a potential migration of the sewage treatment plant’s specialists remains a risk to the sustainability of the project. The intrinsic motivation of technical staff cannot last in a region that pays such professionals much less than other countries.

### **Conclusions and lessons learned:**

The long implementation period and the positive effects of the measures would have made it necessary and possible to adjust the waste water fees in order to bring plant operation closer to the threshold of covering its operating costs. However, the success of the measure does not go hand in hand with a corresponding awareness of the associated costs.

Ensuring that operating costs in waste water treatment plants are covered by the waste water revenue is fundamentally an unresolved challenge. The inclusion of energy-generating and energy-efficient measures in such projects is a good way to improve the operating balance sheet. The better presentation of the link between waste water treatment, long-term security of the water supply and the reduction of health risks raises the recognition of the measures among the population – and potentially also their willingness to pay.

The running costs for the construction and operation of central waste water treatment plants should be distributed over several shoulders, rather than burdening only a geographically limited group of consumers, as they serve to protect the shared regional water resources required to maintain the health of the entire population.

The insurance of the most important operating facilities, as practised by the city of Nablus, offers, on the one hand, the possibility of financing repairs and the potential replacement of the facilities in the event of a failure and, on the other hand, introduces third-party monitoring element, which makes it more necessary for the operator to handle the facilities properly. This experience can be replicated for subsequent projects.



**List of abbreviations**

<b>Cogeneration unit</b>	<b>Cogeneration unit</b>
<b>BOD5/l</b>	<b>Biochemical oxygen demand during 5 days per litre</b>
<b>ECU</b>	<b>Environmental Control Unit</b>
<b>DC</b>	<b>Development Cooperation</b>
<b>FC</b>	<b>Financial Cooperation</b>
<b>JWC</b>	<b>Joint Water Committee</b>
<b>NIS</b>	<b>New Israeli Shekel</b>
<b>PV</b>	<b>Photovoltaic</b>
<b>PWA</b>	<b>Palestinian Water Authority</b>
<b>TC</b>	<b>Technical Cooperation</b>
<b>UNRWA</b>	<b>United Nations Relief and Works Agency for Palestine Refugees in the Near East</b>
<b>WSSD</b>	<b>Water Supply and Sanitation Department</b>
<b>WSRC</b>	<b>Water Sector Regulatory Council</b>

## Evaluation approach and methods

### Methodology of the ex post evaluation

The ex post evaluation follows the methodology of a rapid appraisal, which is a data-supported qualitative contribution analysis and constitutes an expert judgement. This approach ascribes impacts to the project through plausibility considerations which are based on a careful analysis of documents, data, facts and impressions. This also includes – when possible – the use of digital data sources and the use of modern technologies (e.g. satellite data, online surveys, geocoding). The reasons for any contradicting information are investigated and attempts are made to clarify such issues and base the evaluation on statements that can be confirmed by several sources of information wherever possible (triangulation).

#### Documents:

In order to prepare the ex post evaluation, reports prepared during all phases of the project's implementation were reviewed, such as feasibility studies, the KfW appraisal report, the final review report and consultant reports. In addition, strategy papers from the partner country were consulted, such as: the Water and Wastewater Sector Strategy 2014–2016, Policy and Strategy for Palestine, Palestinian Water Authority, 2012–2032, Performance monitoring report for water and waste water providers in Palestine 2020, Water Law “National Water and Wastewater”, Water Sector Strategy 2017–2022, among other things. Evaluations in the region were also a good source for preparing the report, as well as analyses from other donors such as World Bank reports on the economic context in the partner country. Internal project documents, secondary specialist literature, strategy papers, context, country and sector analyses, systematic reviews and media reports were also used.

#### Data sources and analysis tools:

Data sources were on-site reports from the executing agency as well as results of the water quality analyses from Al Najah University. The executing agency provided information on the operation of the project on the basis of a questionnaire prepared by the evaluation mission.

#### Interview partners:

Representatives from various departments of the executing agency, representatives of the municipality of Nablus, representatives of the donors, village councils and representatives of the refugee camps were interviewed.

The analysis of impacts is based on assumed causal relationships, documented in the results matrix developed during the project appraisal and, if necessary, updated during the ex post evaluation. The evaluation report sets out arguments as to why the influencing factors in question were identified for the experienced effects and why the project under investigation was likely to make the contribution that it did (contribution analysis). The context of the development measure and its influence on results is taken into account. The conclusions are reported in relation to the availability and quality of the data. An evaluation concept is the frame of reference for the evaluation.

On average, the methods offer a balanced cost-benefit ratio for project evaluations that maintains a balance between the knowledge gained and the evaluation costs, and allows an assessment of the effectiveness of FC projects across all project evaluations. The individual ex post evaluation therefore does not meet the requirements of a scientific assessment in line with a clear causal analysis.

The following aspects limit the evaluation:

The lack of systematic data in the health sector did not allow any substantiated statements to be made regarding the project's impact on the health protection of the population in the project area.

One limiting aspect was also the short stay on site of the evaluation mission. Due to the tense security situation, the mission could not stay in Nablus. The limited time available was further reduced by the outward and return trips to the project area.

## Methods used to evaluate project success

To evaluate the project according to OECD-DAC criteria, a six-step scale is used for all criteria except for the sustainability criterion. The scale is as follows:

- Level 1** very successful: result that clearly exceeds expectations
- Level 2** successful: fully in line with expectations and without any significant shortcomings
- Level 3** moderately successful: project falls short of expectations but the positive results dominate
- Level 4** moderately unsuccessful: significantly below expectations, with negative results dominating despite discernible positive results
- Level 5** unsuccessful: despite some positive partial results, the negative results clearly dominate
- Level 6** highly unsuccessful: the project has no impact or the situation has actually deteriorated

The overall rating on the six-point scale is compiled from a weighting of all six 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 ("impact") and the sustainability are rated at least "moderately successful" (level 3).

## Publication details

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**List of annexes:**

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Annex 2: Risk analysis

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Annex 4: Recommendations for operation

Annex 5: Evaluation questions in line with OECD DAC criteria/ex post evaluation matrix

Annex 6: ESIA system

## Annex 1: Target system and indicators

Project objective at outcome level		Rating of appropriateness (former and current view)			
During project appraisal: The project objective was to ensure environmentally and healthy waste water disposal in the western part of the city of Nablus and in the upper section of Wadi Zeimar.		Both from the perspective of the two appraisals in 1997 and 2008 and from an evaluation point of view, it turns out that the objective was correctly determined. It is directly aimed at tackling the core cause of water pollution in the project region. Sewage disposal and clarification are generally the main means of protecting limited water supplies from contamination by municipal waste water.			
At EPE (if target modified) The project target also remains consistent from the EPE perspective and is not modified.					
Indicator	Rating of appropriateness (for example, regarding impact level, accuracy of fit, target level, smart criteria)	PA target level  Optional: EPE target level	PA status (year)	Status at final inspection (year)	Optional: EPE status (year)
	The project's indicators were adapted to take into account general knowledge at the second appraisal in 2008. The adjustment is applied to the EPE.				
Indicator 1 (PA)	Waste water treatment plant discharge values (organic pollution): the indicator was established in the second appraisal in 2008 and is a suitable indicator for assessing the quality of the treatment process of the waste water treatment plant.	<20 mg BOD5/l	-	14 mg BOD5/l	9.2 mg BOD5/l Target clearly surpassed
Indicator 2 (PA)	Waste water treatment plant discharge value (suspended solids)	<30 mg SS/l	-	28 mg SS/l	9 mg SS/l Target clearly surpassed
NEW: Indicator 3	Number of people with improved or new waste water treatment Additional indicator for evaluation	0			152,000 inhabitants of Nablus and five villages in the upper reaches of the Wadi Zeimar

Project objective at impact level		Rating of appropriateness (former and current view)			
During project appraisal: The project contributes to protecting regional water supplies in the project region.		The first project appraisal in 1997 set two impact objectives: The project contributes to protecting regional water resources and reducing health risks for the population in the project region. During the second appraisal in 2008, only the contribution to the protection of water supplies was set as an impact objective. From an evaluation perspective, the reduced health risks for the population can also be attributed to the project at development policy level, although the data-based definition of the indicators for this impact objective is not possible with a proportionate effort.			
During EPE (if target modified):		The appraisal did not set any indicators for the achievement of the impact objective. The evaluation mission considers the quality of the water pumped from the deep wells in the area of the western aquifer to be a suitable indicator for achieving the impact objective.			
Indicator	Rating of appropriateness (for example, regarding impact level, accuracy of fit, target level, smart criteria)	Target level PA / EPE (new)	Status (2012)	Status at final inspection (year)	Status at EPE (2022)
NEW: Indicator 1	Total coliform bacteria at Deir Sharaf well		40 cases with total coliform bacterial burden		0 cases
NEW: Indicator 2	Faecal coliform bacteria at Deir Sharaf well		60 cases		0 cases
NEW: Indicator 3	Water-borne diseases in the drainage basin				No signs according to the head of the health department

## Annex 2: Risk analysis

All risks should be included in the following table as described above:

Risk	Relevant OECD-DAC criterion
<p>The justified risk that the waste water treatment plant cannot be operated properly due to the economically and safety-politically difficult environment did not materialise at the time of the evaluation. Even though the project was designed with limited sustainability requirements terms of cost coverage, many measures were successfully implemented that aimed to optimise the economic operation of the waste water treatment plant. Nevertheless, a high residual risk to the sustainability of the project remains if one considers that the operation of the waste water treatment plant depends on cross-financing, and the financial situation of the city of Nablus is very strained.</p>	<p><b>Sustainability</b> <b>Effectiveness</b></p>
<p>The risk of cost overruns due to delays in the approval processes due to the project's conflict-prone context has occurred and has led to increased financing requirements. Nevertheless, the specific costs remain within the acceptable range.</p>	<p><b>Efficiency</b></p>
<p>The risk of uncontrolled discharge of industrial waste water, and thus the impairment of the functionality of the waste water treatment plant, was identified early on, and countermeasures were introduced. The establishment of the environmental control unit in Nablus' urban management serves to monitor and comply with the standards for waste water discharge into the sewage system. The city strives to implement the national regulations that regulate the proper connection of households and industrial enterprises to the disposal system. The efforts of the municipality (with the strong involvement of the environmental control unit) have led to the industrial waste water largely not reaching the waste water treatment plant. The environmental control unit was operational during the evaluation and performs good monitoring work. The identified risk did not materialise, although the activity of this unit does not seem to be ensured in the long term in view of the strained financial situation of the municipality of Nablus.</p> <p>The strategy developed within the scope of the project of co-financing the costs of building the pre-treatment plants at the companies could not be implemented because the companies were not prepared to contribute their share of the financing. Most of the industrial waste water will continue to be discharged into the Wadi Zeimar and thus cause water pollution. The risk remains high that the industrial companies will not bear the costs for pre-treatment of industrial waste water in the future.</p>	<p><b>Effectiveness</b> <b>Efficiency</b></p>
<p>The risk of migration of the now highly qualified specialists, who ensure the proper operation of the waste water treatment plant, remains even if it has not yet occurred. The operating staff still complain about receiving little appreciation and financial acknowledgement from the local management.</p>	<p><b>Sustainability</b></p>



### Annex 3: Project measures and their results

The project included the construction measures for the construction of the waste water treatment plant, which is located approx. 12km from Nablus next to the village of Beit Lid. The project also financed the construction of approx. 12 km of waste water collectors and sewage systems in some villages. The following specific measures were supported by the project.

- extension of the existing sewage network by 2km;
- construction of a rainwater tank with a net volume of 2,000m<sup>3</sup>;
- construction of the main collector up to the waste water treatment plant, total length 8.5km;
- construction of a turnkey waste water treatment plant (activated sludge treatment) with a total capacity of 152,000 PE, including sand trap and grease trap, two primary clarifiers, two aeration tanks and two secondary clarifiers.
- two sludge dewatering plants with belt thickeners for dewatering and treating the sludge were built: the primary sludge thickener, the biogas plant, the gas tank,
- in the first stage, the waste water treatment plant was designed to treat a waste water inflow of 14,000m<sup>3</sup> per day and 8 tonnes BOD<sub>5</sub> per day.
- a cogeneration unit for producing energy from biogas, which is generated from sewage sludge digestion,
- sewage system in adjacent villages,
- two-year operational assistance by the contractor of the waste water treatment plant as well as operational support and procurement of equipment,
- piloting of pre-treatment plants for industrial waste water for companies in Tahina,
- establishment of the environmental control unit for the supervision of waste water disposal in the companies in the Wadi Zeimar Basin.
- SCADA control system.

In addition, the construction of building structures was financed, such as the administrative building, workshop building, substation, emergency power generator room, etc. The systems were generally in good working order at the time of the EPE. The executing agency demonstrates proper operating practices and carries out regular and preventive maintenance of the systems. However, maintenance is not consistently ensured as there are no spare parts or experts available in the local market. One of the belt thickeners was out of operation at the time of the evaluation mission. Servicing the gas engine is difficult because no long-term service contract has been concluded with the supplier.

## Annex 4: Recommendations for operation

The management of the Nablus West waste water treatment plant is very good and can be considered exemplary in German development cooperation. All target values for waste water treatment are met in Nablus West. The average BOD5 value in the waste water treatment plant's discharge was 8.2 mg/l in 2021, while the suspended solids value TSS was 10 mg/l. The utilisation of the waste water treatment plant has reached the planned capacity.

The high quality of waste water treatment in Nablus is based on cleverly chosen treatment technology and the extremely high motivation of the operating staff. In order to maintain this high level of motivation and dedication of the staff in the long term, excellent working conditions and constant recognition of the work performed are necessary. During the EPE, it was found that the chief operator is very familiar with his waste water treatment plant and its process flows and that his team is highly motivated.

In order to maintain this motivation in the long term, appropriate incentives are required, for example by expanding training activities, activating involvement in international committees and professional associations such as IWA, ACWUA, etc. An important platform for specialist exchange and, if necessary, further training could also be further expanded via the existing city partnership between Nablus and the City of Nuremberg.

Spare parts procurement in Palestine is problematic, expensive and very time-consuming, as very cumbersome approval procedures and import conditions hinder imports. Although the city of Nablus has insured the assets of the waste water treatment plant, which was intended to enable replacement purchases and prevent long-term failures, short to medium-term failures can only be limited by the provision of spare parts and preventive maintenance. At the time of the EPE, for example, these preventive maintenance measures were somewhat delayed for the belt filter presses, as only one belt filter press appeared ready for use at the time. Despite scarce funds, it would be very useful if the municipality raised the budget for spare parts in order to be able to keep sufficient quantities of important spare parts.

Since no solution for the final storage or disposal of sewage sludge has been available so far and a transfer to the landfill appears costly and not very sustainable, it would be important from the EPE's point of view to include the development of this solution in the further cooperation of DC with Palestine.

## Annex 5: Evaluation questions in line with OECD-DAC criteria/ex post evaluation matrix

### Relevance

Evaluation dimension: Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting ( - / o / + )	Reason for weighting
Policy and priority focus	The project is closely aligned with the strategic objectives of the partner country, as defined in sector strategies and relevant laws. Under the conditions of the region's water shortages, protecting existing water supplies and reusing treated waste water in agriculture is a top priority and goes hand in hand with the efforts of the Palestinian authorities to increase water availability. The project is part of German DC's support for the Palestinian authorities in achieving their national and sectoral development plans and is closely linked to the country strategy, which provides for the development of sustainable water infrastructure to improve the living conditions of the Palestinian population, reduce health risks and promote resource management.		2	0	
Are the objectives of the programme aligned with the (global, regional and country-specific) policies and priorities, in particular those of the (development policy) partners involved and affected and the BMZ?	Sectoral strategies and water/waste water-related action plans of the Palestinian Authority at the time of the appraisal and during implementation must be reviewed. Role of the Palestinian water authorities. Country strategy paper	PP sector section, project manager, Country Manager, regional team (brief political-economic analysis), Internet			
Do the objectives of the programme take into account the relevant political and institutional framework conditions (e.g. legislation, administrative capacity, actual power structures)?	Water laws, any water-related regulations in the Palestinian Territories	PP sector section, project manager, country manager, regional team (brief political-economic analysis=PÖK), Internet			
Focus on needs and capacities of participants and stakeholders	Improving hygiene conditions and protecting scarce water supplies are primary needs for improving the living conditions of the project's target group. Even if the capacities of those affected were not available before the project, they were built up as part of the implementation.		2	0	
Are the programme objectives focused on the developmental needs and capacities of the target group?	Review the problem analysis of the project: How was the appraisal prepared? Were there upstream data and studies	Previous studies, fact-finding missions			

Was the core problem identified correctly?	that illuminated the sanitation situation and water supply in Nablus?			
Were the needs and capacities of particularly disadvantaged or vulnerable parts of the target group taken into account (possible differentiation according to age, income, gender, ethnicity, etc.)? How was the target group selected?	Is there a concept for how the vulnerable target groups of the low-income population in the old districts of Nablus and especially the refugees were taken into account?	Appraisal report, previous studies		
Appropriateness of design	The concept dates back to 1997 and corresponded to the level of knowledge at the time.	2	0	
Was the design of the programme appropriate and realistic (technically, organisationally and financially) and in principle suitable for contributing to solving the core problem?		Project report, final inspection Questionnaire, On-site survey		
Is the programme design sufficiently precise and plausible (transparency and verifiability of the target system and the underlying impact assumptions)?	Is the impact chain plausible from today's perspective? Is there a clearly defined link between the core problems such as the endangerment of water resources in the entire Wadi Zeimar catchment area due to the improper disposal and treatment of waste water and the project objective? Is the relationship between the indicators at outcome level and the impact objectives justifiable? No indicators are defined for the impact. The automatic nature of the effectiveness of achieving the outcome objective on the impact will have to be critically examined: impact and outcome are considered achieved when the treatment plant is in operation and the indicators are achieved.	Project report, final inspection, comparable old projects in the region (QUER) final inspection		

<p>Please describe the impact chain, incl. complementary measures. Is this plausible?</p>				
<p>To what extent is the design of the programme based on a holistic approach to sustainable development (interplay of the social, environmental and economic dimensions of sustainability)?</p>	<p>How is the general water supply situation taken into account in the design?          How did the tense security situation and the region's economic development affect the project?          Does the project have relevance for regional politics and particularly for peace policy?          The PP refers to "limited sustainability". What exactly does this mean – the unachievable coverage of operating costs?          Since sustainability is a key factor for the EPE, is the project's eligibility for promotion also to be affirmed from the EPE's perspective despite the limited sustainability?</p>	<p>PP, final inspection report,</p>		
<p>For projects within the scope of DC programmes: is the programme, based on its design, suitable for achieving the objectives of the DC programme?</p>	<p>The project was implemented in close cooperation with TC. At the time of the PA, the concept of joint DC programmes did not yet exist. At the time, this was still called a cooperative programme.</p>	<p>On-site survey</p>		
<p>Response to changes/adaptability</p>	<p>The implementation of the project was put on hold for a long time due to the outbreak of the second Intifada. During implementation, the project was adapted to the economic situation of the population and the technical requirements. As a result, the project reacted excellently to the changed framework conditions.</p>	<p>1</p>	<p>0</p>	
<p>Has the programme been adapted in the course of its implementation due to changed framework conditions (risks and potential)?</p>	<p>What was the existing situation during the appraisal? The implementation extends over a long period of time, from the inspection to the operational handover. What adaptation measures were necessary?</p>	<p>PP, implementation reports</p>		

## Coherence

Evaluation dimension: Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting ( - / o / + )	Reason for weighting
Internal coherence (division of tasks and synergies within German development cooperation):	The project is closely related to the TC activities in Nablus, which were geared towards building up the department's capacities for water supply and sewage disposal. Through TC support, two units were trained in the department, responsible for the operation of the waste water treatment plant and the maintenance of the sewer network. In addition, TC supported the introduction of volume-based waste water tariffs.		2	0	
To what extent is the programme designed in a complementary and collaborative manner within the German development cooperation (e.g. integration into DC programme, country/sector strategy)?	Does the Federal Ministry for Economic Cooperation and Development (BMZ) have a sector strategy for the Palestinian Territories? Is there interaction within DC in the Palestinian Territories (especially between FC and TC) and specifically in Nablus and the surrounding area?	PP, reports, GIZ			
Do the instruments of the German development cooperation dovetail in a conceptually meaningful way as part of the programme?	Are the DC projects in the area of waste water disposal and water supply in Nablus interlinked? Are the other FC measures in the area of waste water disposal, waste management and agricultural irrigation in the region complementary and coherent?	Country Manager, reports, GIZ  Please mention the regional overlap of the waste water disposal and water supply project in Nablus here and the resulting synergy effects			
Is the programme consistent with international norms and standards to which the German development cooperation is committed (e.g. human rights, Paris Climate Agreement, etc.)?	Which Sustainable Development Goals do the measures contribute to and how? What about other guidelines for the water and waste water sector?				

<p>External coherence (complementarity and coordination with actors external to German DC):</p>	<p>The high investment needs in the water sector in the Palestinian Territories are faced with the very limited financial scope of the Palestinian authorities to make the necessary investments. The Palestinian Territories depend on external investment in the waste water sector. There is good coordination work on geographical delimitation and institutional coordination in the water sector. The main coordination effort is handled by the Palestinian Water Authority. The donor working group on water, which was co-led by DC until 2016, also contributes to coordination.</p>		2	0	
<p>To what extent does the programme complement and support the partner's own efforts (subsidiarity principle)?</p>	<p>What efforts are being made by the municipality of Nablus to increase the connection rate to the waste water and water supply network? Have implementation agreements as part of the separate agreement (increase in the average collection rate to 75%, introduction of consumption-dependent waste water fees that can cover 70% of the current operating costs) been developed together with the municipality of Nablus? And have these been met? Has the counterpart contribution been made as agreed?</p>	<p>Questionnaire to executing agency and from on-site interviews</p>			
<p>Is the design of the programme and its implementation coordinated with the activities of other donors?</p>	<p>Classification of the project in the overall structure of the FC projects and other donors. Is there donor coordination on site?</p>	<p>On-site mission</p>			
<p>Was the programme designed to use the existing systems and structures (of partners/other donors/international organisations) for the implementation of its activities and to what extent are these used?</p>	<p>To what extent is the water and waste water department of the city of Nablus involved in the design and appraisal? How was the cooperation with other donors during the design and implementation phases? Have the technical capacities of the partner been used?</p>	<p>Questionnaire to executing agency and on-site survey</p>			
<p>Are common systems (of partners/other donors/international organisations) used for</p>	<p>An investigation must be conducted to assess whether there are coordination platforms between donors in the Palestinian Territories with a</p>	<p>Questionnaire to executing agency and on-site survey</p>			

monitoring/evaluation, learning and accountability?	specific focus on water management. It should also be determined whether there are nationwide structures for sectoral knowledge management.	
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## Effectiveness

Evaluation dimension: Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting (- / 0 / +)	Reason for weighting
Achievement of (intended) targets	The project has achieved the intended objective of environmentally and health-friendly waste water disposal in the western part of the city of Nablus and in the upper section of the Wadi Zeimar Basin.		1	-	Continued discharge of dirty water into the Wadi Zeimar can be observed.
Table of indicators: Comparison of actual/target	Target	Actual			
(1) Discharge values for the waste water treatment plant	<20 mg BOD5/l	9.2 mg BOD5/l Value is clearly surpassed			
(2) Discharge value for the waste water treatment plant (suspended solids)	<30 mg SS/l	9 mg SS/l Value is clearly surpassed			
(3) NEW indicator: Number of people with improved or new waste water treatment Additional indicator for evaluation	152,000 inhabitants of Nablus and five villages in the upper reaches of the Wadi Zeimar	152,000 inhabitants of Nablus and five villages in the upper reaches of the Wadi Zeimar Target achieved			
Contribution to achieving objectives:	The project made a significant contribution to achieving the objectives. The design and subsequent optimisation of the measures led to proper sewage disposal and treatment in the project area. The waste water treatment process continuously shows discharge values that meet the planned standard. The indicators have even been exceeded. The complementary measures have enabled the key personnel of the waste water treatment plant to proficiently control and further optimise the operating process.		1	0	



<p>To what extent were the outputs of the programme delivered as planned (or adapted to new developments)? (Learning/help question)</p>	<p>How did the waste water project in western Nablus react to the deteriorating safety situation between the two appraisals? Have there been technological adaptations? What were the adjustments to the measures?</p> <p>Are Qusin and Dayr Sharaf now connected to the sewer system, but that wasn't yet the case during the final inspection? Are additional villages connected to the new sewage system?</p>	<p>Questionnaire to executing agency, laboratory results, final inspection report</p>
<p>Are the outputs provided and the capacities created used?</p>	<p>Are there monitoring reports from the environmental control unit regarding the operation of the waste water treatment plant, or does the executing agency itself have a control laboratory? Log books?</p> <p>Is the connection rate of the population in Nablus to waste water disposal satisfactory? If not, does this have anything to do with the location and design of the waste water treatment plant and collectors? Has the discharge of untreated waste water into the river been effectively halted by the new waste water treatment plant?</p> <p>What is the utilisation rate of the sewage treatment plant? Is there a requirement to connect to the waste water system?</p>	<p>On-site check</p>
<p>To what extent is equal access to the provided output and created capacities (e.g. physical, non-discriminatory, financially affordable) guaranteed?</p>	<p>How is the cost structure, cost coverage and tariff adjustment concept developing in a consumption-oriented manner for the low-income population groups, billing and payment efficiency?</p>	<p>Questionnaire for the executing agency, also for determining the collection rate, technical and non-technical losses, comparison of EPE-PP</p>

<p>To what extent did the programme contribute to achieving the objectives?</p>	<p>Have the project measures been implemented according to plan and are the financed plants operated properly? Would the objectives have been achievable without the measure?</p>	<p>Questionnaire for executing agency</p>			
<p>To what extent did the programme contribute to achieving the objectives at the level of the intended beneficiaries?</p>	<p>Have the project measures been implemented according to plan and are the financed plants operated properly? Would the objectives have been achievable without the measure?</p>	<p>Questionnaire for executing agency</p>			
<p>Did the programme contribute to the achievement of objectives at the level of the particularly disadvantaged or vulnerable groups involved and affected?</p>	<p>To examine how the disadvantaged groups of old town residents and refugee camps have benefited in particular from the measures.</p> <p>The PP of the 1997 project contains a reference to the employment opportunities of vulnerable groups as part of the project. Did this result in any impacts?</p>	<p>On-site survey</p>			
<p>Which project-internal factors (technical, organisational or financial) were decisive for the achievement or non-achievement of the intended objectives of the programme? (Learning/help question)</p>	<p>Has the waste water project or treatment technology been adapted?</p> <p>Are the technical and operational capacities of the water and sewage department constant?</p> <p>Is cross-financing from the city budget still necessary?</p>	<p>Implementation reports</p>			
<p>Which external factors were decisive for the achievement or non-achievement of the intended objective of the programme? (Learning/help question)</p>	<p>A Palestinian-Israeli water committee determines the water usage rights in the occupied areas. How did the project react to this unique feature?</p>	<p>On-site survey</p>			
<p>Quality of implementation</p>	<p>The building materials and supplied equipment are of good quality. The construction and installation work has also been carried out properly. Long-term maintenance contracts were not concluded with the manufacturer of the system.</p>	<p>2</p>	<p>0</p>		

<p>How is the quality of the management and implementation of the programme (e.g. project-executing agency, consultant) evaluated with regard to the achievement of objectives?</p>	<p>Considerable flexibility in the implementation of the waste water measure was required, as the implementation had to be stopped at a time when the construction measures had only just been awarded. Why was the implementation stopped and for how long?</p> <p>How should the attitude of the project-executing agency and of the municipality be evaluated with regard to the project implementation? Have the implementation agreements been complied with? Were they sufficient? Was the executing agency's contribution helpful in ensuring the necessary building land and licences?</p>	<p>Project reports, before on-site observations</p>			
<p>How is the quality of the management, implementation and participation in the programme by the partners/sponsors evaluated?</p>	<p>What role did the project-executing agency play during the design and implementation? Has the executing agency contributed to the final design and supervision of works?</p>				
<p>Unintended consequences (positive or negative)</p>	<p>One unintended positive effect of the project is the reduction of the measured nitrogen content in the sewage effluent achieved through good process management.</p>		<p>1</p>	<p>0</p>	
<p>Are unintended positive/negative direct effects (social, economic, environmental) identifiable (or foreseeable)?</p>	<p>Is there reliable data on the quality of water resources in the project region? Are the pre-treatment plants for industrial waste water properly operated? Are the costs incurred for the maintenance and preservation of the financed systems and the entire operation socially acceptable? Is there financial support from external sources?</p>	<p>Statistics, studies, Internet</p>			
<p>What potential/risks arise from the positive/negative unintended effects and how should they be evaluated?</p>	<p>The project's risks are correctly identified in the project's PP and final inspection. As part of the EPE, intended and</p>	<p>PP, final inspection</p>			

	unintended impacts, if available, are identified and reviewed for their potential and risks.	
How did the programme respond to the potential/risks of the positive/negative unintended effects?	This is probably about the project's response (adjustment) to changes that have occurred in the meantime. Has the waste water treatment system created prerequisites for follow-up projects, in particular for the use of treated waste water for irrigation purposes?	Reporting from Palestinian reports, follow-up projects

## Efficiency

Evaluation dimension: Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting ( - / o / + )	Reason for weighting
Production efficiency	The funding needs during the first appraisal in 1997 were underestimated and financing increased several times, up to more than twice the original volume. The high consulting costs of 19% can be attributed to the long implementation time of the project (approx. 20 years), which was also caused by the long interruption due to the drastically deteriorating security situation. The specific costs, based on 152,000 inhabitants benefiting from the project, can be estimated at around EUR 262 per person.		3	0	
To what extent were the inputs of the programme used sparingly in relation to the outputs produced (if possible in a comparison with data from other evaluations of a region, sector, etc.)? For example, comparison of specific costs.	Unit costs EUR 262, see project completion report section 3.1, compare with other projects. The per capita investment costs of the project are higher than in comparable FC projects. See sewage disposal section 6.01 (specific investment costs). To save investment and operating costs, adjustments were made to the treatment technology. Price increases?  Are there comparable values from similar projects in the region of specific investment and operating costs per 1,000 or 10,000 inhabitants?	Neighbourhood projects in the Middle East are cross-checked in the QUER portal			

<p>If necessary, as a complementary perspective: To what extent could the outputs of the programme have been increased by an alternative use of inputs (if possible in a comparison with data from other evaluations of a region, sector, etc.)?</p>			
<p>Were the outputs produced on time and within the planned period?</p>	<p>No, the results of the waste water project experienced extreme delays (13 years?). Has this made the measure more expensive? What factors led to this?</p>	<p>Project reports</p>	
<p>Were the coordination and management costs reasonable (e.g. implementation consultant's cost component)?</p>	<p>The appropriateness of the implementation consultant? Present and question costs.</p>	<p>Comparison with other sewage disposal projects via the QUER portal</p>	
<p>Allocation efficiency</p>	<p>When the project was designed and during the operation of the constructed facility, great importance was attached to cost efficiency, although this project did not include the principle of covering operating costs through income. Nevertheless, the operator's efforts to operate the plant economically and to partially cover the energy costs by generating electricity from the cogeneration unit integrated into the project or using solar panels must be appreciated. The cost recovery ratio of approx. 60% could be improved by increasing the waste water tariffs, which have not been adjusted for a long time.</p>		<p>3      0</p>
<p>In what other ways and at what costs could the effects achieved (outcome/impact) have been attained? (Learning/help question)</p>	<p>The EPE will address this question.</p>		
<p>To what extent could the effects achieved have been attained in a more cost-effective manner, compared with an alternatively designed programme?</p>	<p>The EPE will address this question.</p>		

<p>If necessary, as a complementary perspective: To what extent could the positive effects have been increased with the resources available, compared to an alternatively designed programme?</p>	<p>The EPE will address this question.</p>	
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## Overarching developmental impact

<p>Evaluation dimension: Evaluation question</p>	<p>Specification of the question for the present project</p>	<p>Data source (or rationale if the question is not relevant/applicable)</p>	<p>Rating</p>	<p>Weighting ( - / 0 / + )</p>	<p>Reason for weighting</p>
<p>Overarching developmental changes (intended)</p>	<p>The project has contributed to the protection of regional water resources. Even though the second appraisal of the project in 2008 distanced itself from the developmental objective of reducing health risks, the positive contribution of the project to this is entirely plausible, although it cannot be measured in concrete terms.</p>		<p>2</p>	<p>0</p>	
<p>Is it possible to identify overarching developmental changes to which the programme should contribute? (Or if foreseeable, please be as specific as possible in terms of time).</p>	<p>How do the projects affect structures in the Palestinian waste water sector? How are the projects assessed from the perspective of the Palestinian Water Authority? Has the project had a positive impact on the PA's finances?</p>	<p>Results from the Internet search, interviews during the mission on site</p>			
<p>Is it possible to identify overarching developmental changes (social, economic, environmental and their interactions) at the level of the intended beneficiaries? (Or if foreseeable, please be as specific as possible in terms of time).</p>	<p>Have relevant developmental changes occurred for the population of the western part of Nablus West and the northern section of the Wadi Zeimar Basin as part of the implementation of the measures? The construction site for the sewage treatment plant built was provided by the city of Nablus. How were the property rights secured? Has there been expropriation or dislocation?</p>	<p>Observations during the mission on site</p>			

<p>To what extent can overarching developmental changes be identified at the level of particularly disadvantaged or vulnerable parts of the target group to which the programme should contribute (Or, if foreseeable, please be as specific as possible in terms of time).</p>	<p>Around half of the beneficiaries are considered poor. During the PP, the population has spent up to 6% of their income on waste water disposal / water supply. How is the situation in 2022, has that improved? What project impact can be identified? Are reductions in health risks measurable? Perhaps broken down by population group?</p>	<p>The Palestinian Central Bureau of Statistics, Internet research World Bank reports</p>			
<p>Contribution to overarching developmental changes (intended)</p>	<p>Through proper waste water disposal and clarification, the project directly and significantly contributed to protecting the quality of the water in the western aquifer and to preventing the deterioration of ground water quality due to the untreated discharge of municipal waste water into the Wadi Zeimar.</p>	<p>2</p>	<p>0</p>		
<p>To what extent did the programme actually contribute to the identified or foreseeable overarching developmental changes (also taking into account the political stability) to which the programme should contribute?</p>	<p>Would the changes have occurred even without the measure? Can they really be ascribed to the measure?</p>	<p>On-site observations</p>			
<p>To what extent did the programme achieve its intended (possibly adjusted) developmental objectives? In other words, are the project impacts sufficiently tangible not only at outcome level, but also at impact level? (E.g. drinking water supply/health effects).</p>	<p>While the protection of regional water resources and reduction of health risks are indirectly influenced by the project objectives in the long-term, it is necessary to investigate whether there is evidence for this.</p>	<p>Statistics office</p>			
<p>Did the programme contribute to achieving its (possibly adjusted) developmental objectives at the level of the intended beneficiaries?</p>	<p>How has the social and economic situation of the population in the project area developed? Is there reliable data on this? Do the measures have an impact on peace policy outcomes?</p>	<p>Reports</p>			

<p>Has the programme contributed to overarching developmental changes or changes in life situations at the level of particularly disadvantaged or vulnerable parts of the target group to which the programme was intended to contribute?</p>	<p>Did the project focus on the concerns of disadvantaged groups, especially the residents in the refugee camps? How has the social and economic situation of the disadvantaged population in the project area developed? Is there robust data on income development, unemployment, etc.?</p>	
<p>Which project-internal factors (technical, organisational or financial) were decisive for the achievement or non-achievement of the intended developmental objectives of the programme? (Learning/help question)</p>		<p>Project reports, on-site interviews</p>
<p>Which external factors were decisive for the achievement or non-achievement of the intended developmental objectives of the programme? (Learning/help question)</p>		<p>Project reports, on-site interviews</p>
<p>Does the project have a broad-based impact?</p> <ul style="list-style-type: none"> <li>- To what extent has the programme led to structural or institutional changes (e.g. in organisations, systems and regulations)? (Structure formation)</li> <li>- Was the programme exemplary and/or broadly effective and is it reproducible? (Reproducible character)</li> </ul>	<p>What institutional structures have been established by the project? Are the water and waste water departments in the city of Nablus up to the task? Are the management instruments used in the course of the project, such as the <b>environmental control unit</b>, embedded in the entire structure of water/waste water management in the Palestinian Territories? Has there been a change in the mentality of integrated water management? Has the separation and commercialisation of the water/waste water department been implemented?</p>	<p>Conversations with the executing agency with the Palestinian Water Authority</p>



	What are the project-executing agency's future challenges?			
How would the development have gone without the programme?	How would the discharge of untreated waste water have affected the quality of ground water and relations with the Israeli side?	Health authority, executing agency survey		
Contribution to (unintended) overarching developmental changes	The living conditions of the population are improved by improving hygiene conditions along the Wadi Zeimar. There was an increase in the value of the properties in the catchment area of the project, and a trend of young families moving to the surrounding villages, where the sanitation situation was improved by the project.		2	0
To what extent can unintended overarching developmental changes (also taking into account political stability) be identified (or, if foreseeable, please be as specific as possible in terms of time)?	Unintended developmental changes are identified.	On-site monitoring		
Did the programme noticeably or foreseeably contribute to unintended (positive and/or negative) overarching developmental impacts?	How has the social and economic situation developed in the project areas? Did the measures contribute to this? Did the measures contribute to this? The waste water measure has an effect on the entire catchment area of the Wadi Zeimar and the Alexander River on the Israeli side. Can specific developments related to the project be identified?	Official statistics, studies		
Did the programme noticeably (or foreseeably) contribute to unintended (positive or negative) overarching developmental changes at the level of particularly disadvantaged or vulnerable groups (within or outside the target group)?	Were there any other effects, e.g. improvement of living conditions (fewer unpleasant odours, etc.)	On-site survey		

## Sustainability

Evaluation dimension: Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting ( - / o / + )	Reason for weighting
Capacities of participants and stakeholders	In view of the difficult security situation in the project area, where the operator faces major financial and logistical challenges, the limited sustainability requirements, as noted in the second audit in 2008, are still valid. The shortfall in operating costs from the operator's own income is compensated by cross-financing from the municipal budget. The excellent process control in the waste water treatment plant would justify a tariff adjustment. At a technical level, the systems were also in good condition in view of the long period of operation. The operator applies preventive maintenance practices and proactively orders spare parts. However, the financial capacities of the city of Nablus are limited.		3	0	
Are the target group, executing agencies and partners institutionally, personally and financially able and willing (ownership) to maintain the positive effects of the programme over time (after the end of the promotion)?	<p>Has the migration of trained specialists identified as a risk occurred? Is the salary structure also appropriate for the private sector? Is the operation of the waste water treatment plant still secured? How are operating costs covered? Are there preventive maintenance concepts? Is cross-financing still being used? What is the collection rate? Solvency and willingness to pay for waste water disposal measures in the population in view of the currently prevailing tariff structure (block tariff or consumption-dependent from a certain income for waste water), burden compared to the average income compared to the PP (still 6% for water supply and waste water disposal, or less? limit was 5% at PP). Do refugees also pay or not? What percentage of waste water disposal system users does this account for?</p> <p>Average water tariff had scope for adjustment upwards, see section 4.11 in the PP. Was it used?</p>	Questionnaire to executing agencies with query of very specific figures and relationships from 2021 to determine production, losses, collection rate, operating cost coverage and proportionate target group burden with the current fees (more or less than 6%)?			

	<p>How did the waste water fee under section 4.12 in the PP develop? According to the project completion report, the waste water tariff was increased, see p. 8. Cost-covering waste water tariffs in the meantime? Results of the tariff study? Earmarking of the tariff revenues? How high are the current dynamic operating and actual costs?</p> <p>Is land irrigated with the treated waste water, and if so, which crops? Do farmers wear appropriate protective clothing? Are the WHO guidelines for irrigation with treated waste water observed?</p> <p>Were farmers offered employment opportunities in accordance with PP section 6.07?</p>				
<p>To what extent do the target group, executing agencies and partners demonstrate resilience to future risks that could jeopardise the impact of the programme?</p>	<p>What risks can jeopardise the measures? The water volumes in the West Bank are scarce and cannot meet demand. Are the population groups willing to bear the costs? Was the environmentally friendly waste landfill referred to in section 6.17 established for improved ground water protection or not (high risk of counteractive effects).</p> <p>What about industrial treatment of waste water from Tahini production and other industries, see page 4 of the project completion report?</p>				
<p>Contribution to supporting sustainable capacities:</p>	<p>The project has looked for ways to ensure technical and financial sustainability. Institutional support, technological adjustments to the implementation and the establishment of the environmental control unit have contributed to this. Nevertheless, the</p>	3	0		

	operation of the transverse system would not be economically viable without cross-subsidisation from the budget of the city of Nablus.				
Did the programme contribute to the target group, executing agencies and partners being institutionally, personally and financially able and willing (ownership) to maintain the positive effects of the programme over time and, where necessary, to curb negative effects?	Has the project-executing agency's financial situation changed? How has the collection rate developed over the years for waste water and water supply services? Has the appreciation of the beneficiaries (demonstrated by willingness to pay) developed for "THEIR" water supply / waste water disposal system?	Executing agency questionnaire, on-site surveys			
Did the programme contribute to strengthening the resilience of the target group, executing agencies and partners to risks that could jeopardise the effects of the programme?	If behavioural changes have occurred among the beneficiaries, are climate change phenomena such as further scarcity of water resources (almost the entire water supply is dependent on ground water), flooding, etc. apparent?	On-site observations			
Did the programme contribute to strengthening the resilience of particularly disadvantaged groups to risks that could jeopardise the effects of the programme?	Specific focus on vulnerable population groups, given that the refugee camps are not managed by the city of Nablus and other rules apply there.	Direct contact with refugee camp representatives during the mission			
<b>Durability of impacts over time</b>	The durability of the project's impact largely depends on the executing agency's will and options to continue financing the operation of the sewage treatment plant, which has been good to date. In view of the limited financial scope and the unstable security situation in the region, the risk of losses in the operation of the waste water treatment plant is to be regarded as high.		3	0	
How stable is the context of the programme (e.g. social justice, economic performance, political stability, environmental balance)? (Learning/help question)	Is the political and economic situation in the Palestinian Territories stable, especially in Nablus? Are there still negative ecological situations due to waste water after the end of the project?	On-site visit, discussions with the city, observations during the mission			

	What role do the (effective or ineffective) measurements of the environmental control unit play here?	
To what extent is the durability of the positive effects of the programme influenced by the context? (Learning/help question)	The sustainable operation of the financed plants depends on many factors. It must be checked whether the risks identified in the PP with regard to the migration of technical experts or deterioration of the security and economic situation have occurred and whether the results of the project have been influenced as a result. The cost recovery ratio for waste water measures should also be checked.	Executing agency questionnaire
To what extent are the positive and, where applicable, the negative effects of the programme likely to be long-lasting?		

