

Ex post evaluation

Water loss reduction programme, Nablus II, Palestinian territories



Title	Reducing water loss, Nablus II		
Sector and CRS code	14020 Water supply and sanitation – large systems		
Project number	2006 66 479 (inv.), 2015 70 407 (complementary measure), 2099		
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)		
Recipient/Project-executing agency	City of Nablus, Water and Wastewater Department		
Project volume/ Financing instrument	EUR 17,063,160 (FC grant), EUR 531,000 (complementary measure), EUR 335,000 (training)		
Project duration	2007 - 2017		
Year of report	2022	Year of random sample	2020

Objectives and project outline

Due to the scarcity of resources, ensuring the water supply for the city of Nablus in the long term is of key importance. The outcome-level objective was to enable the city of Nablus to provide drinking water more efficiently through restructuring and rehabilitation measures in the water supply system. The measures identified during project design were fundamentally suitable for making the water supply in Nablus more efficient.

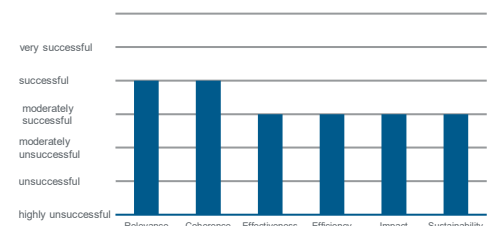
Key findings

Even if the project's target indicators were only partially achieved, this project averted a deterioration in the water supply situation in Nablus and made the city more resistant to the difficult conditions (low water availability with increasing demand for drinking water, demanding operation of the supply system with large differences in altitude).

The restructuring of the water supply system in Nablus was necessary, but was not consistently carried out. Even after completion of the project, the operator did not sufficiently implement the required separation of the pressure zones in the supply area. The project's design was based on the optimistic assumption of sufficient water availability in Nablus, i.e. the newly constructed pumping stations were actually designed for a continual water supply. Under the prevailing conditions of the intermittent water supply, the supplied pumps now operate outside their optimum operating range. This was readjusted several times as part of the complementary and training measures.

Unfortunately, the operator does not strictly follow the recommendations of the training consultant with regard to pump operation and optimum installation of the water meters in the entire urban area. Only about 80% of the operating costs of the water supply system can be covered. Due to the limited effectiveness, efficiency and sustainability, the project is rated as moderately successful overall.

Overall rating:
moderately successful



Conclusions

- An appropriate design of the pumps that takes into account the intermittent water supply could have saved the time-consuming and costly readjustment.
- In order to sustainably reduce unaccounted for water, a consistent physical separation of the pressure zones built by the project would have had to have been implemented.
- In projects like this, the installation of the water meters supplied should always be directly incorporated into the corresponding supply contracts in order to avoid any subsequent non-installation.

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 “Water loss reduction programme Nablus II” (BMZ no. 2006 66 479) and the associated complementary measure (BMZ no. 2015 70 407) and training measure (BMZ no. 2099 14 722). The city of Nablus lies in a narrow valley between the Ebal and Gerizim mountains in the northern part of the West Bank. Some of the city’s buildings are up to 500 metres tall. This topography places particular demands on an adequate water supply. 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 (2030). The project is related to the previous project “Water loss reduction programme Nablus I” (BMZ no. 1999 65 252), in which a similar concept improved the efficiency of the water supply in the Rafidia district. The evaluation took place under difficult security conditions in the project area.

Brief description of the project

As part of this project, repair and rehabilitation measures were carried out for the city of Nablus’ drinking water network, which included the following measures: Restructuring of the network, construction of drinking water tanks, creation of new or refurbishment of existing pumping stations, replacement of part of the distribution network, supply of bulk water meters and building water meters, measurement and control technology in addition to the construction of a central control room and the procurement of equipment for locating and repairing leaks. The resulting water loss reduction was intended to lead to greater water availability for the residents of the region and to more efficient management of the existing water resources. Under the complementary measure (BMZ no. 2015 70 407), the executing agency received support in developing an operating and maintenance concept. The aim of the basic and advanced training measure (BMZ no. 2099 14 722) was to optimise the entire operation of the water supply in Nablus with a particular focus on the management of the established pressure zones and corresponding pump stations. Around 221,000 residents of the city of Nablus and the surrounding villages have benefited from the project.

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

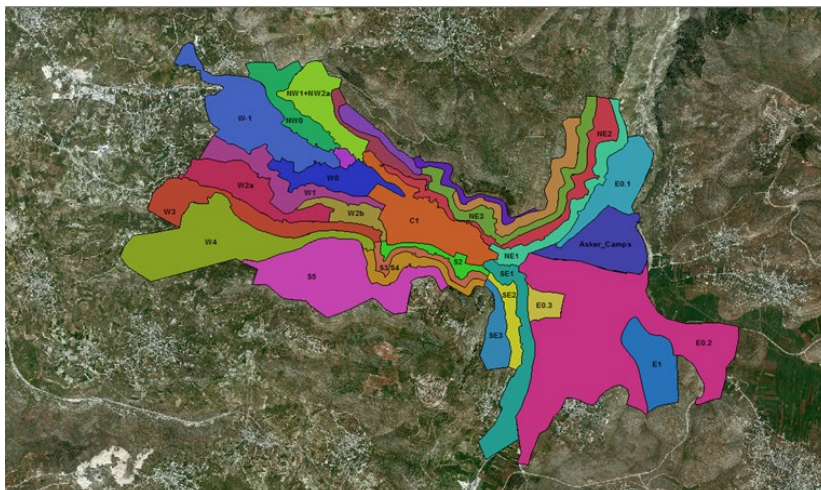


Figure 1: water supply pressure zones in the urban area of Nablus

Source: The consultant Consulaqua’s own overview in the final report of the training measure

Breakdown of total costs

	Inv. (planned)	Inv. (actual)	Accom- panying measure (planned)	CM (actual)	Training (planned)	Training (actual)
Investment costs (total) in EUR	15,800,000	18,988,955	500,000	531,106	335,000	335,000
Counterpart contribu- tion	1,500,000	1,925,795	0	0	0	0
Debt financing	14,300,000	17,063,160	500,000	531,106	335,000	335,000
of which BMZ budget funds	14,300,000	17,063,160	500,000	531,106	335,000	335,000

Rating according to OECD-DAC criteria

Relevance

The long-standing Israeli-Palestinian conflict determines the population's access to territories and resources. Access to water in the West Bank has been restricted since the war in 1967, when Israel took full control of all water resources. The Oslo II Accord of 1995 granted Palestinians in the West Bank restricted water access rights. It was decided to set up a Joint Water Committee (JWC) together with an equal number of Israeli representatives, which would deal with all water and wastewater issues in the West Bank and coordinate the management of the common aquifers. However, the implementation of the accord has proved asymmetrical to the detriment of the population in the West Bank. Not only that the proportion of water allocated to the Palestinians in the West Bank was only a quarter of the proportion allocated to Israelis, but each infrastructure measure implemented in Zones C and B¹ was in fact subject to a strict and complicated approval process by the Israeli authorities. The Palestinian Water Agency's powers were limited to water-related services, while resource management of all water resources was incumbent on the Israeli side. The Oslo II Interim Accord of 1995 was intended to be valid for five years and then be replaced by a definitive arrangement, but this has never occurred. With a water supply of approx. 75m³ per person per year, the Palestinian territories (West Bank and Gaza Strips) are among the countries with the lowest reserves of renewable water worldwide. The low water availability is the cause of many conflicts in the region. The forecasts for climate change indicate that the already low water availability will continue to decrease due to the predicted reduction in precipitation (10%–20%) and the intensification of evaporation.

In a region characterised by water scarcity and limited control over water supplies, security of the water supply is given the highest priority. For example, the strategy for the water sector, in which the Palestinian Water Authority is playing a leading developing role, emphasises the country's increased access to the water supply and sanitation as a development priority. In addition to increasing water availability, improving the efficiency of water supply systems is also cited as a priority. The project is therefore well integrated into the partner country's water sector objectives. In addition, the project has been in line with the Federal Ministry for Economic Cooperation and Development's (BMZ) priority area since 2013: "Better infrastructure in the water sector in the Palestinian territories". In 2016, the Federal Ministry for Economic Cooperation and Development (BMZ) decided to end the priority area of water. Since then, no funding has been made available for the West Bank.

In Palestine, the Palestinian Water Authority (PWA) is the highest authority in the water sector at national level. According to the Water Law from 2014, it is responsible for managing all water supplies in the Palestinian territory, developing all water policies, strategies and plans, as well as for their implementation. PWA also represents the Palestinian Territories in negotiations with Israel in the JWC, which decides on all issues relating to the management of water resources. The Water Sector Regulatory Council (WSRC) is responsible for monitoring the

¹ According to the Oslo II Accord, the West Bank has been divided into three zones. Zone A, which includes the larger cities, is under Palestinian control. Israel is in control of administrative and security matters in Zone C; in Zone B, Israel is in charge of security while the Palestinian Authority has administrative control.

performance of water utilities, determining tariffs and licensing suppliers. However, at the time of the project appraisal (2007), the Regulatory Council was not yet operational. In the meantime, the Regulatory Council has established itself well in the sector, even though its activities depend on donor support, and its powers have also been restricted again by a PWA decree.

Over 300 regional, municipal and local public utilities are responsible for the provision of water and wastewater services in the Palestinian territories. The water sector as a whole in the West Bank is considered to be very fragmented, without a clearly defined distribution of roles and competences. The 2014 law attempted to consolidate the sector by promoting the merger of many small municipal and local utilities into regional water utilities, but this has not prevailed in practice. In addition, Palestinian cities are reluctant to waive their responsibility for water and wastewater, as they see these services as an important source of income for their scant budgets.

The executing agency of the project was the city of Nablus with its Water Supply and Sanitation Department (WSSD). It has received support from DC since 1993 in building up its operational and technical capacities. In addition to the city of Nablus, WSSD is also responsible for water supply in 15 surrounding villages and in four refugee camps in the city of Nablus.

Focus on needs and capacities of participants and stakeholders

The secure water supply posed a daily challenge for the residents of Nablus. The project appraisal took place when the city of Nablus was affected by the destruction as part of the second intifada (violent conflict between the Palestinians and Israelis, which took place in the West Bank and Gaza Strips) and the disputes following Hamas' election victory in 2006. Both events had a severe impact on the economic development of the region.

The core problem of the limited availability of raw water was correctly identified. There was not enough water available in Nablus to ensure a continual supply of water; the supply was only available intermittently about every three days. The development of new raw water sources is a highly volatile conflict issue in the region between the Palestinian Authority and Israel. Therefore, the project avoided this controversial issue and instead focused on reducing unaccounted for water and increasing water supply efficiency, thus improving living conditions for all population groups in the project area, without differentiating according to the income or gender of the beneficiaries.

Appropriateness of design

Complicated by scarce raw water availability, outdated water infrastructure, years of uncontrolled expansion of the distribution network in a complicated topography characterised by large differences in altitude, the water supply at the project appraisal in 2006 was characterised by low water consumption per person (69 l/p/d), inadequate supply duration, high total unaccounted for water (non-revenue water approx. 35%) and a low cost recovery ratio of 65% of operating costs. Households were unable to pay cost-covering water fees for the inadequate supply. Due to the limited budgets, WSSD was unable to finance the necessary investments to develop new water sources and reduce technical unaccounted for water.

To stop this downward spiral, the project focused on financing the necessary investments in expanding water availability by reducing unaccounted for water. The high level of connection to the central water supply network (98%) in the city of Nablus and the acceptable quality of groundwater from the aquifers were good prerequisites for implementing this type of project. Compared to the situation in the entire governorate of Nablus, where 21% of the population was not connected to a central water supply network, the city of Nablus itself was in a privileged position with a connection rate of 98%. At the time of the appraisal, the city of Nablus' water supply was available intermittently approx. twice per week by pumping into the respective pipes and the collecting containers mounted on top of the roofs.

In principle, the storage measures are suitable for achieving the project objective of a more efficient water supply in Nablus. The restructuring of the water distribution system, the construction of new main and distribution lines, the establishment of a separate pressure zone, the installation of new pumps and house connections as well as the improved control of the system were intended to reduce technical and administrative losses and thus increase the water availability for the residents in the project area. The concept of dividing the existing, practically uncontrollable water supply system into smaller, hydraulically separated pressure zones was and is the right way to optimise the supply pressure (up to 20 bar in some parts prior to the project), minimise line breaks due to overpressure in the low-lying parts of the city and thus provide more water overall for the residents in the entire project area. The elimination of leaks was intended to increase water availability, and the shorter supply duration

with more frequent supply intervals (three times instead of twice per week) reduce the risk of water contamination in the entire supply system. All of this would contribute to reducing the risk to the health of the population due to waterborne diseases and to managing scarce water resources more efficiently.

Based on the data that can be found, the impact of the project on improving the health situation in the city ex post cannot be verified, but it can be traced as an impact hypothesis. In most villages of the Nablus governorate (not the target group of the evaluated project), there is no central water supply. Residents often have to cope with less than 50 litres per day and are forced to use water or rainwater delivered to tanks. Tank water is often contaminated and costs twice as much as the water from the central supply system in the city of Nablus, especially during the summer months. Improving the water supply system in rural areas of the governorate of Nablus would have a direct impact on reducing the health risks posed by water-induced illnesses.

From today's perspective, it should be noted that the complexity of the water supply system in Nablus was underestimated in the design. In hindsight, intermittent pumps should have been procured rather than pumps that are designed for continuous operation. The latter wear more quickly due to repeated switching on and off during intermittent use. Many technical adjustments in the operation of the entire supply system (particularly with regard to the operation of the pump stations) were made as part of the training and complementary measures started in 2014 onwards, both of which were carried out by the same consultant (Consulaqua).

Response to changes/adaptability

The project was based on the hydraulic network analysis produced as part of the previous project "Water loss reduction Nablus I". Apart from the necessary technical adjustments that were made as part of the training and complementary measures with regard to the optimal operation of the distribution network, this measure remained unchanged.

Summary of the rating:

Although the design of the pumps procured as part of the project was not optimal for solving the core problem, we rate the project as successful overall in terms of its relevance – in particular due to the outstanding importance of an efficient water supply in a region with insufficient water supplies.

Relevance: 2

Coherence

Internal coherence

The project is phase II of an existing programme. Phase I involved the replacement of main lines and parts of the distribution network, as well as the installation of house connections and water meters in Rafidia, a district of Nablus. As part of the first phase, Studies and Experts Fund resources were used to finance the creation of the hydrological model for the entire area of the city of Nablus.

TC and FC provided complementary support for the organisational development of the water supply and wastewater disposal department of the city of Nablus (WSSD) and supported the implementation of this project. TC provided organisational support for the establishment of WSSD. The business plans of WSSD were developed with the help of GIZ until 2014. Under the Oslo II Interim Agreement, the Israeli government has committed to approving an additional well for water supply in the Nablus area. As a result, TC funds were used to finance the construction of the well in Deir Sharif in the western part of the city, which provides about 10% of the water supply in Nablus. Overall, the project is well integrated into all DC activities to build up a sustainable water supply in the Palestinian territories.

External coherence

The project is in line with Palestine's development vision and objectives, as defined in all strategies and plans from 1995 to the current National Water and Wastewater Strategy 2021–2023. The main objectives of this strategy are protecting water resources, increasing the quantity of water supplied to the Palestinian population, reliably and fairly supplying citizens with good water quality, strengthening the financial independence of water suppliers, improving payment efficiency and reducing the debts of water suppliers, as well as securing the sustainability of

the water supply.

The city of Nablus already had a high water connection rate (98%) before the project was implemented. However, the water infrastructure in the city was already over 70 years old. This was one of the reasons for the high technical losses in the system. The project was designed and implemented in close cooperation with the executing agency (WSSD) and the other donors. The entire water sector in the Palestinian territories is largely dependent on donor financing. The WSSD was not financially able to rehabilitate the outdated water supply infrastructure itself and was therefore dependent on debt financing. In 2012, a Memorandum of Understanding was signed between donors and the Palestinian Authority, in which all actors agreed on principles of alignment. Overall, however, the implementation of the MoU's recommendations (in terms of setting up joint working groups, drawing up annual work plans, monitoring sector development) was not particularly successful due to the limited coordination capacities of the Palestinian Water Authority.

As part of Jenin and Hebron's water supply, USAID financed around USD 71.9 million, while AFD financed around EUR 36.5 million as part of Jenin and Bethlehem's water supply. The World Bank manages a trust fund co-financed with AFD to finance the wastewater treatment plant in Hebron. Germany was the lead donor until 2016, when this role was transferred to the Netherlands.

Summary of the rating:

Overall, the project is in line with the strategic direction of the Palestinian authorities. It was developed largely in coordination with the other donors in the sector and harmonises with the objectives of German DC in the water sector.

Coherence: 2

Effectiveness

Achievement of (intended) targets

The target achievement at outcome level with regard to the more efficient provision of drinking water is summarised in the table below:

Indicator	Status during PA	Target value PA	Actual value at final inspection	Actual value at EPE
(1) Reduction of total non-revenue water (NRW) in the pressure zones rehabilitated by the project	31%	25%	28%	31.9% Value not completely achieved.
(2) 15% reduction in power consumption of pumps in the urban area of Nablus	0.93 kWh/m ³	0.79 kWh/m ³	0.76 kWh/m ³	0.84 kWh/m ³ Value not completely achieved.
(3) Supply intervals	2 days/week	3 days/week	2.3 days/week	2 days/week Value not achieved
(4) % water analyses compliant with WHO quality standards - Free chlorine, positive - Total coliform, negative - Faecal coliform, negative - Nitrate < 50 mg/l	Not known	WHO standards	> 99% < 99% < 99% < 20 mg/l WHO standards achieved	> 99% < 99% < 99% < 20 mg/l WHO standards achieved
(5) Increase in water consumption	69 l/p/d	+ 10%	Not specified	82 l/p/d Value achieved

The Head of the WSSD Water Supply Department suggested to the EPE mission that water consumption per person per day be introduced as an additional indicator of target achievement. The appraisal had predicted that this value would have deteriorated if the project had not taken place. Indeed, water consumption has increased from 69 l/p/d (litres per person per day) in the 2006 appraisal to approx. 82 l/p/d. The improved water extraction by using more efficient water pumps, which were financed by the project, certainly contributed to this. This additional indicator was therefore included in the target system.

Contribution to achieving targets

It should be noted that two out of five of the project's target indicators have been achieved (no. 4 and 5). In retrospect, the definition of the target values in the appraisal of the project must be considered too ambitious in view of the difficult conditions in the urban area of Nablus and the financial resources available. Under the conditions of limited water availability, operation prior to the implementation of this project focused only on the most necessary water supply for the population of Nablus and limited itself to filling the roof tanks in Nablus with drinking water one to two times per week. There was a lack of adequate concepts for monitoring, operation and maintenance of the existing distribution network. Without division into pressure zones, adequate operation of the pump stations and monitoring of the supply pressure in the network, adequate monitoring of the water supply system was not possible. The large differences in altitude in the urban area of Nablus added complexity and inequality to the water supply.

All of this posed major challenges for the operator, which had overburdened its technical and financial capacities. As part of this project, 30 pressure zones were planned with the aim of optimising the high water pressure (above 20 bar) and reducing energy consumption. The project was able to reduce the water pressure in around one third of the pressure zones to 2–10 bar, which was intended to reduce the number of line breaks and thus also unaccounted for water in the medium term. After commissioning, the newly installed pumps caused many interruptions to the water supply, as they were operated outside of their actual design of a 24-hour water supply. Of the 65 pumps financed by the project, 35 were originally intended as operating pumps and 30 as stand-by pumps. However, according to our observations, all pumps are put into operation alternately in order to shorten the supply intervals for water distribution. This is not in line with the original operating concept. The energy consumption at the pump stations per m³ of water shows an increasing tendency, which can be attributed to the improper operation of the pumps. The entire supply system in Nablus is very energy-intensive. The water must be pumped to different heights to the tanks or directly to the pressure zones. The energy costs account for approx. 40% of the operating costs, which also represents a high energy consumption value by national standards. With a current energy consumption of approx. 0.84 kWh/m³, the target value of 0.79 kWh/m³ could not be fully achieved.

Since not all of the 30 planned pressure zones could be separated from one another during the course of the project, at least the lower zones receive water around the clock. In the summer months, the supply situation is more difficult as water consumption increases. In order to effectively implement the loss reduction, all pressure zones must be consistently separated from one another, but this was only successfully achieved in around one third of the zones (approx. 10 out of 30). The unaccounted for water would have to be systematically identified and eliminated using leak detection equipment. After all, the project managed to bring the water supply pressure under control to a large extent and to avoid excessive pressure values of up to 25 bar, values that were detected before the project. Today, the majority of the project area is served with optimum 2–10 bar supply pressure, which can reduce line breaks and thus also unaccounted for water. However, the complete separation of all pressure zones was not achieved during the implementation of the project, as there was a lack of technical documentation for all lines and connections.

Another weakness affecting administrative (non-technical) unaccounted for water in Nablus' water supply system is the incorrect measurement of household water consumption by the installed water meters. Even though almost all household connections (approx. 47,000) are equipped with water meters, their supplied water consumption data is doubtful. Either the water meters are too old and have not been calibrated periodically, or they have been incorrectly installed. It is not possible to establish an adequate water inventory for the pressure zones under these conditions. The installation of the water meters supplied by the project and the correct measurement of water consumption were expected to increase revenues. The training consultant had developed a concept that envisaged the creation of an account where these additional revenues would be paid in and additional meters would be purchased as a result. Neither this concept nor the plan to reduce unaccounted for water has been put into practice by the executing agency WSSD. By contrast, around 5,000 of the 12,900 water meters supplied as part of the project have not even been installed yet. WSSD cited the restrictions during the COVID-19 pandemic as the reason for this. Nevertheless, WSSD has developed a plan to have these advance-payment-based new

meters installed by third-party contractors.

The installation of the control room (SCADA-combination of software and hardware elements for **Supervisory Control and Data Acquisition**) enabled data-based control of the pressure zones, which led to a better analysis of the operation of the pump stations as part of the training measure. One positive aspect is the WSSD personnel's competent handling of the control room, which is monitored by the mission and enables automatic operation of the water distribution system. The staff were satisfied with the new control capacities of the system. In the past, staff were forced to manually operate the system and open or close the valves on the tanks or pumping stations after telephone communication. Supported by the installation of bulk water meters at the water production sites, pumping stations and water tanks, the project enabled WSSD to better monitor and report on unaccounted for water and energy consumption. In line with the available Geographic Information System data, WSSD tries to allocate consumption to the established pressure zones in order to establish a zone-based water inventory in accordance with IWA (International Water Association). The mission was thus able to receive monthly up-to-the-minute data on zone-based unaccounted for water and energy consumption. This gives rise to legitimate hopes that unaccounted for water will be reduced in the future.

The **quality of drinking water** is a sensitive issue and is regularly monitored accordingly. There is a water disinfection unit in WSSD which is responsible for the inspection and treatment of drinking water. Every year, 600–700 tests are taken at various points in the distribution network (pumping stations, water tanks, even at end consumer locations) and analysed for their microbiological and chemical parameters in the laboratories of Al Najah University. The raw water for supplying the urban area of Nablus mainly comes from wells outside the city and some sources in the urban area; chlorination is used to treat the water to combat bacteriological pollution. Good quality is indicated by the tests carried out in the deep wells (up to 300m deep), while the tests at the sources show high incidences of coliform bacteria (78%) and faecal coliform bacteria (83%). The sources are fed by higher water layers that are exposed to higher contamination pressure. The water samples collected from the end user, on the other hand, show compliance with the recommended standard values in terms of residual chlorine content, nitrate and bacterial load. Good water quality can be assumed at the time of the evaluation. A certain risk of microbial contamination – especially during the hot season – is the long holding time of the water in the 1.5–3m³ individual water tanks on the roofs of the residential buildings. Increasing the delivery intervals would have led to a reduction in the time the water spends in these containers and thus reduced the risk of microbial contamination. On average, however, the duration of supply remained unaffected by the project. Most pressure zones are supplied at intervals of one to two days per week. During this supply interval, the storage capacities (private roof-mounted containers and water reservoirs) are filled, and the water stored in this way is used during the period until the next supply interval.

The aim of the complementary measure was to enable the executing agency to sustainably operate the facilities financed by the project. The following measures, among others, were carried out by the consultant Consulaqua Hamburg financed by the project: introduction of the concept of separation and management of supply pressure zones, detailed analysis and improvement of pump operation, creation of pressure zone-based water inventories, introduction of operating processes with regard to the localisation and repair of leaks in the network, management of bulk and consumer water meters.

The training measure, carried out by the same consultant as the complementary measure, included specific training activities in relation to pressure zone management, preparation of the water meter strategy and a plan for the reorganisation of the water and wastewater department of the city of Nablus. Both measures have made a significant contribution to improving water supply operations in Nablus.

The project replaced around 30% of the existing water distribution network in Nablus and 65 of the more than 80 pumps in the supply system. Even with more FC funds, however, achieving the target values of the indicators would not have been certain, given the limited water availability (external restriction of target achievement). However, the project made a significant contribution to ensuring that the water supply situation in Nablus did not deteriorate further due to increased pipe breaks.

Based on the discussions and interviews held on site, it has been shown that the project is largely rated as positive. Above all, it is estimated that the improved operation of the system means that water distribution is more uniform at all levels of the city, especially the higher levels, which has led to an absence of conflicts within the city. The project thus had a conflict-reducing dimension – all sections of the population benefited from it without any differentiation according to gender or social situation.

Quality of implementation

The project was designed and supervised by a consultant (Lahmeyer) that was already involved in other projects in the region. However, the design criteria were already based on the unrealistic assumption that the water availability would allow a 24-hour water supply per day and that the entire system, including the pump capacity and the distribution network, was designed for this. The current conditions of intermittent water supply (and the widespread practice of individual water storage in roof water tanks) made this originally targeted 24-hour operation impossible. Readjustment was carried out here as part of the training measure in order to adapt the actual pump design to the local conditions after the fact.

Unintended consequences (positive or negative)

It can be assumed that the operation of the newly installed pumps outside their optimum operating range will lead to their earlier wear and tear, which in future will have an adverse effect on the operator's maintenance and operating costs and reduce the sustainability of the results (see section on Sustainability).

Summary of the rating:

Although the indicators were only partially achieved, we still rate the effectiveness of the project as moderately successful, as without the project the supply system in the city of Nablus would have deteriorated rapidly. The continuous supply pressure of 20–25 bar in different zones of the city would have led to increased line breaks – and thus to even higher unaccounted for water. Adequate supply to residents on the higher-altitude city streets would have been virtually impossible and social conflicts would have been inevitable. In general, the inhabitants of the city would have had less water available with higher losses. The water might have had to be kept in the rooftop containers for a longer period of time, which would have increased the risk of microbial contamination. This would have had a negative impact on the health of the population. The project stopped this negative spiral, creating the conditions for improved operation of the water supply system in Nablus.

Effectiveness: 3

Efficiency

Production efficiency

Around 221,000 inhabitants in Nablus and some surrounding villages have benefited from the project, including four refugee camps with around 47,000 inhabitants. The total costs of the project amount to EUR 18.9 million and were funded with EUR 17.06 million from FC grant funds and EUR 1.9 million from the counterpart contribution. In addition, EUR 0.53 million in FC funds were used for the complementary measure and EUR 0.34 million for the training measure. Based on the total costs and the number of beneficiaries, there are specific costs of approx. EUR 89/person, which are also within the acceptable range by regional comparison.

The construction measures were divided into eight construction lots and awarded to one regional and six local companies. From today's perspective, the division of measures into small construction lots seems suboptimal in terms of transaction costs. Locally, it was argued that local firms would work more cost-efficiently, while international construction firms would set higher prices due to high security risks in the region. However, the local tender for the main investment measures resulted in higher costs than planned. In addition, there were unforeseeable additional costs due to difficult ground conditions, several additional pumps that needed to be procured and construction delays. For these reasons, an increase of EUR 3 million was approved in 2011. The project's term more than doubled from the original project design at the time of the project appraisal (mid-2008 to mid-2011) to more than seven years by the beginning of 2016.

The costs of the implementation consultant (Lahmeyer) almost doubled to EUR 1.5 million now, compared to the original estimate at the project appraisal of EUR 0.8 million. Overall, we consider the costs of the implementation consultant of EUR 1.5 million to be appropriate at around 8% of the total costs. In addition, there are the costs for the complementary measure (EUR 0.53 million) and training (EUR 0.34 million), which were carried out by the same consultant Consulaqua Hamburg and were only approved at a later date (training in 2013, complementary measure in 2017). From the executing agency's point of view, this proved to be expedient.

Allocation efficiency

In almost all zones established by the project, lines of different lengths were replaced or expanded, based on the existing hydraulic model and the supplier's experience. This approach has proven insufficient to considerably reduce unaccounted for water. From the reports on total unaccounted for water related to pressure zones, it can be concluded that, in the pressure zones, where more investments were made in the renewal and expansion of the distribution network, total unaccounted for water is also lower compared to total unaccounted for water in the pressure zones, where less was invested.

Optimal operation of a water supply system also depends on properly equipping the consumer connections with water meters. Despite efforts on the part of the consultants and KfW during the implementation of the measures to encourage the municipality to install and calibrate the water meters, this was not achieved to the desired extent. The city of Nablus recognises the need to adequately measure water consumption, but has not done much in this regard at the time of the evaluation. From the perspective of the evaluation, however, the installation of functional water meters is a core component of an efficient water supply.

WSSD does not act as an economically independent entity, but is firmly anchored in municipal management, and is therefore fully funded by the urban budget. In Nablus' budget, the income and expenditures attributable to water supply activities are not recognised separately. The proceeds from the water bills are simply regarded as income of the city and are not explicitly used for the operation of the water supply. The city of Nablus did not implement the step-by-step operational self-sufficiency plan for WSSD recommended by the project. Under these types of conditions, WSSD lacks incentives to optimise its operating costs and recover them through tariff revenues. The project's design provided for full coverage of the operating costs of the water supply services from tariff income. However, the operating cost coverage from the water revenues required by the implementation agreements has not been achieved in full, but rather only to around 80%. Still, this is a significant improvement compared to the value at the project appraisal (65%). The tariffs for the first two consumption levels of the applied block tariff have increased compared to the time of the project appraisal. For example, the tariff for the first 10 m³ consumption in 2007 was NIS 3.72 (EUR 1.05); today it is NIS 4.2 (EUR 1.19). For the second tariff block (10.1 – 15m³), the m³ price rose from NIS 5.58 to NIS 7.2 (EUR 1.58 to EUR 2.03) (2021). However, there have been no further tariff adjustments in the last four years. The instructions of the guidelines for the water regulator and the municipal ordinances on the calculation of full costs and their pricing into the water tariffs were not observed. The average price actually invoiced is currently approx. NIS 5.59/m³ (EUR 1.56), and thus in the upper end of the tariff range in the West Bank. In theory, it would at least cover the operating costs. Nevertheless, the proceeds from the sale of water are too low, as the collection rate (the percentage of revenue actually generated from invoices issued compared to the total invoiced amount) is still too low. According to the project-executing agency's reports, the collection rate is currently only 61% and is therefore still significantly beneath the target value of 70% stipulated in the implementation agreement. Moreover, fee payment is not borne equally by all beneficiaries. In the densely populated refugee camps, the collection rate is only 24%.

Summary of the rating:

Since only 80% of the executing agency's operating costs (mainly due to the low collection rate) can currently be covered by the revenues from the sale of water, and insufficient efforts are also being made to optimise economic operation, the efficiency of the project can only be rated as moderately successful.

Efficiency: 3

Impact

The impact objective of the project was to contribute to maintaining the population's health. Target achievement at the impact level can be summarised as follows:

Indicator	PA status	Target value according to PA	(Optional) actual value at final inspection	Actual value during EPE
(1) no signs of water-induced deterioration in the state of health in Nablus	Not specified (N/A)	(N/A)	(N/A)	Value achieved (after consultation with the hospital in Nablus)

Contribution to overarching (intended) developmental changes

The project had the overarching developmental objective of contributing to securing and improving the health situation in Nablus. The project is based on the assumption that by reducing the technical and administrative unaccounted for water in Nablus and the surrounding area, more safe drinking water would be available to the residents in the project area, thereby contributing to the developmental objective (improvement of health among beneficiaries). At the level of the developmental impact, no target indicators were determined during the project appraisal. In our view, the impact hypothesis is understandable, but it is not really verifiable. Although there were reports of waterborne diseases (especially diarrhoea) before the project, there is a lack of standardised analyses and epidemiological studies on the health status of those affected in order to define demonstrable indicators from them. A meaningful contribution analysis is not possible without meaningful baseline data (ex-ante).

Ultimately, the data situation is not sufficient to capture the development of the health situation in a valid manner. Local health services were unable to provide reference data. In general, all respondents were satisfied with the quality of the drinking water and confirmed that the water from the central supply system is drinkable. The city's hospital has also not provided up-to-date statistics on waterborne illnesses upon request.

Contribution to overarching developmental changes (intended)

The project did not significantly lead to the intended reduction in unaccounted for water. However – through the better separation of individual pressure zones – it has also contributed to the fact that the scarce water was distributed somewhat more fairly throughout the urban area and thus the potential for distribution conflicts has been reduced. By making the system more efficient, the water supply in Nablus was made more resistant to future technical and business risks. Without this project, the operation of the complicated water system in Nablus would not be permanently secured. The technical unaccounted for water would have increased even further due to broken pipes without the project. In addition, a greater number of tank trucks would have been required to supply the population with water. The price of the water supplied by tank trucks is NIS 12/m³ (EUR 3.39), which means that water supplied in this manner costs more than twice as much as the water from the urban supply system. This would have been barely affordable for poorer residents. Per capita water consumption would probably have declined, which would have led to a deterioration in health (especially of poor people). In this respect, the project made a significant contribution to reducing the financial burden on poor residents.

Contribution to impact (unintended)

The water shortage was often the cause of social conflicts in the project region before the project was implemented. The residents of the higher-altitude districts in particular complained that they were receiving too little or no water from the urban water supply. The project enabled a fairer distribution of the available water – and thus opened up access to clean water for all citizens to a large extent. The partner reported that no more water distribution conflicts between the districts of Nablus have been observed since the project was completed. In this respect, the project had a conflict-reducing side effect.

Summary of the rating:

The project increased the availability of water, especially in the higher-lying zones, and thus alleviated distribution conflicts. Without the project, the city of Nablus would be more dependent on tank trucks due to increased pipe breaks, in which case the price of the water is more than twice as high as in the urban water system. In this respect, the project has an impact relevant for poverty. Although no clearly attributable changes can be identified, we assume that the project contributed to ensuring that the health of the beneficiaries did not deteriorate and

therefore rate the overarching developmental impact of the project as moderately successful.

Impact: 3

Sustainability

Capacities of participants and stakeholders

During the on-site evaluation, the evaluation mission gained a good impression of the level of knowledge of the operating staff. In terms of technical tasks, WSSD seems to be well-organised. The established processes in terms of system monitoring and water loss reduction are managed with competence. Employees are able to produce and report on the water inventory on a monthly or annual basis (both for the entire system and for each pressure zone individually). The unaccounted for water and energy consumption are monitored on a monthly basis. The bulk meters on the containers, production sites and pumping stations are regularly read. In addition, since the SCADA control system was put into operation in 2015, the pump operation and level of the water tanks have been monitored in real time. The competent specialist personnel are familiar with the management and operation of the SCADA system. The SCADA Central Control Unit is housed in a building next to a pumping station that is in good condition. These are all good technical prerequisites for sustainable operation of the project.

The financed infrastructure measures have been in operation since 2015. A random inspection revealed that the plants were largely in good condition. However, the executing agency reported some pipe breaks in the HDPE lines laid by the project (HDPE stands for high density polyethylene), which may indicate improper construction – or increased water pressure in the system.

The capacity of the pumps is rated for a 24-hour water supply per day, while in Nablus almost all established pressure zones can only be supplied intermittently. As a result, the pumps are operated outside their optimum range, which can lead to premature operational damage. It was found that, although each new and rehabilitated pumping station was fitted with one to two operating pumps and a backup pump, contrary to the technical instructions, the entire installed pump capacity is used for the cyclic supply of the pressure zones. On the one hand, it is understandable that under conditions of water scarcity, efforts are made to keep the filling cycles of the existing storage capacities as short as possible. On the other hand, this means that the useful life of the pumps is reduced because more frequent pumping is required. In addition, there are no spare parts on the local market, and replacing pumps is a difficult task. Another risk is the uncontrolled housing construction in higher locations of the city outside the planned pressure zone boundary. This also overwhelms the proper operation of the pumps.

In order to improve the sustainability of the impacts achieved, the pressure zones would have to be separated more consistently from one another and reliable reports on the zone-based water inventory would have to be produced. The inconsistency of the supplied data indicates unnoticed connections between the pressure zones established within the scope of the project. On the one hand, it is understandable that the distribution network is difficult to control in a densely populated urban area with a population density of 6,568 people per km², but on the other hand, the lack of separation of pressure zones calls into question the long-term effectiveness of the water loss reduction concept developed as part of the project. A separate construction contract within the scope of the project was intended to separate the main lines according to the pressure zones, but this does not seem to have taken place seamlessly. This is probably the reason why zone-based water loss reports vary greatly and often provide unrealistic, inconsistent data.

The city of Nablus' water department understandably focuses on increasing water volumes and supply intervals. Otherwise, the department is more reactive to reported leaks in the network, while proactive, predictive maintenance processes cannot be identified.

We see the greatest risk in terms of sustainability in the lack of WSSD's financial autonomy. WSSD does not have its own enforcement powers to take action against defaulting customers. In the case of electricity, the power supply is stopped immediately when payors default. In contrast, the municipality's accounting books show an accumulation of third-party debts to WSSD. In April 2022, the WSSD's unsettled accounts receivable amounted to approx. EUR 80 million. 53% of these were arrears from households, schools and hospitals, 30% from refugee camps, 12% debt from villages supplied by WSSD and approx. 5% debt from government institutions. The arrears grow by approx. 0.2% each year. On the other hand, WSSD's liabilities are primarily to the energy supplier, which is an independent company owned by the city of Nablus. The annual water-related WSSD sales amount to the equivalent of EUR 13.9 million. However, WSSD's lack of financial sustainability does not have any direct

consequences for operation, as WSSD is fully integrated into the municipal management, which bears the financial burden. The generated revenue is fed into the general municipal budget and is not automatically allocated to WSSD expenditures. WSSD is only responsible for the technical operation of the water supply, while it relies on other departments within the municipality for other functions such as accounting and bookkeeping, customer administration, procurement and human resources administration. WSSD provides the City Council with an annual schedule of expenses, which the latter approves. The finances of the city of Nablus are under a good deal of pressure, and it is not surprising that after the payment of salaries, the approximately 263 employees of WSSD do not have enough funds to operate and maintain the system.

If fees were collected more efficiently, the evaluation mission estimates that operating cost coverage would be possible. Currently, operating cost coverage is around 80%. While this represents an improvement compared to the value at the time of the project appraisal (65%), it is not yet sufficient to fully ensure the financial viability of the operation. The city of Nablus wants to overcome the problem of low collection rates by installing pre-payment meters. From the perspective of the evaluation, this is also a good path, which has led to a noticeable improvement in collection rates elsewhere in the Palestinian territories. On the other hand, all of the meters supplied as part of the project would also have to be installed for this purpose. 5,000 of the 12,000 meters procured as part of the project are still in the WSSD warehouse.

Contribution to supporting sustainable capacities

The delivery and installation of high-quality equipment required intensive training of WSSD employees, which was carried out during the various phases of the project. The capacities of the water department built up as part of the project to monitor unaccounted for water and energy consumption, to create water balances, to automatically control the system, and to locate and repair leaks, etc. were particularly noteworthy. The contribution of the training measure to the development of instructions and processes for the operation of the pump station, the monitoring of the distribution network, the efficient use of the control room (SCADA), etc. was a positive aspect. All these measures have enabled the WSSD operating personnel to independently identify problems during operation and search for suitable solutions.

However, it is worth noting that the executing agency is unwilling to implement some of the recommendations developed during the course of the project. This means that the water meter strategy is not being pursued to an adequate degree (see above). The concept for pump operation, according to which one of the two newly installed pumps should serve as a replacement pump in each of the pump stations, is also disregarded. In addition, a plan was developed to increase the institutional and financial autonomy of WSSD in its relationship with the municipality, but this was not put into practice.

Durability of impacts

The employees encountered during the evaluation mission appreciated the knowledge transfer during the project, but at the same time stated that further training measures were required.

Other factors that can influence the durability of the impacts are institutional in nature. There is no evidence that the city of Nablus would be willing to give WSSD more organisational and economic independence. Organisational transformation would have to be carefully considered and implemented.

Summary of the rating:

In view of the development of the executing agency's expertise supported within the scope of the project, but the still existing economic and technical risks, we rate sustainability as moderately successful in summary.

Sustainability: 3

Overall rating: 3

The overall assessment takes into account the specific circumstances of the project. The low water availability in the project region makes it difficult to achieve its objectives and – as an external factor – is the biggest problem. More consistent implementation of the concepts developed as part of the project to increase efficiency and reduce water loss (inventory of all lines, plan for water meter installation, concept for appropriate pump operation, roadmap for the organisational development of WSSD) could have led to even more sustainable successes of

the measures. Overall, the experts therefore conclude that the project is only moderately successful (rating 3).

Contributions to the 2030 Agenda

The project is closely linked to the 2030 Agenda and contributes directly to achieving the United Nations Sustainable Development Goal (SDG) no. 6 to ensure access to water and sanitation for all by 2030.

The project has contributed to ensuring that around 221,000 residents in Nablus and the surrounding area have fairer access to the scarce water resources in the region. In particular, some higher-lying parts of the city, which could not be supplied with water before the project, now receive water from the central supply network on a regular basis – albeit with interruptions. The quality of the water from the urban supply system is better, with a more socially acceptable price compared to other water supply methods, e.g. tank trucks (sub-objective of SDG 6.1: achieve universal and equitable access to safe and affordable drinking water for all).

The project provided the technical and operational conditions to stabilise the water supply of the city of Nablus under the difficult conditions of insufficient water availability. The know-how created by the project helps to maintain the operation of the complex water supply in Nablus (sub-objective 6.a.: by 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies).

The city of Nablus received significant support from the project in making the water supply more effective for its citizens (sub-objective 6.b: support and strengthen the participation of local communities in improving water and sanitation management).

The project also contributed to ensuring that the regional conflict over water in the border region between the West Bank and Israel did not intensify further, as it focused on more efficient use of existing water resources and not on expanding water availability by tapping into new raw water sources. This might have led to further conflicts with Israel, which claims full control over all water resources (including those of the Palestinian territories). The project thus followed the “do-no-harm principle” and had a conflict-reducing effect.

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 able to expand and improve the physical capacities of the water supply system in Nablus.
- It has made the chaotic and unsustainable water supply system in the city of Nablus more controllable.
- Despite intensive preparation, the project underestimated the complexity of the water supply in Nablus. The specified design criteria – especially with regard to the targeted 24-hour water supply (and the corresponding dimensioning of the pump output) did not take into account the realities on site. The local conditions of the lack of water and the resulting only intermittent water supply jeopardise the functionality of the pumps not designed for this purpose in the long term.

Conclusions and lessons learned:

- If the supply of water meters is planned, their installation should be included to the greatest degree possible in the building and supply contracts, since the optimal operation of a water supply system depends on the proper equipment of the consumer connections with water meters. Ultimately, the installation of functional water meters is a core component of an efficient and economically viable water supply.
- For demanding water supply projects that take place in a technically and organisationally complicated environment, the executing agency’s technical advice proves to be indispensable for a longer period of time, even after the construction measures have been completed. The support from the training consultant, which was valued by the executing agency, should ideally have been maintained for a longer period of time. The transfer of knowledge – not only with regard to operational but also technical topics (consistent separation

of pressure zones, predictive water pressure management, optimal pump operation, water loss reduction and maintenance) increased the knowledge about the functionality of the water supply systems at the executing agency and, with further support, also improves their operation in the long-term.

- The technology to be procured as part of the project should match the specific local operating conditions as far as possible (here: pumps suitable for intermittent use).

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 wastewater 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 method used was mainly a comparison between the state prior to the project and today. The inadequate data situation was particularly limiting at impact level, as was the critical security situation.

This meant that the evaluation mission could not stay in the project area and often had to change its travel route.

List of abbreviations

AFD	Agence Française de Développement
DC	Development Cooperation
FC	Financial Cooperation
GIS	Geographic Information System
HDPE	High Density Polyethylene
IWA	International Water Association
JWC	Joint Water Committee
NIS	Israeli New Shekel
NRW	Non Revenue Water
PWA	Palestinian Water Authority
SCADA	Supervisory Control and Data Acquisition
SDG	Sustainable Development Goals
TC	Technical Cooperation
USAID	United States Agency for International Development
WHO	World Health Organisation
WSRC	Water Sector Regulatory Council
WSSD	Water Supply and Sanitation Department

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).

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List of annexes:

Annex 1: Target system and indicators

Annex 2: Risk analysis

Annex 3: Project measures and results

Annex 4: Recommendations for operation

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

Annex 1: Target system and indicators

Project objective at outcome level		Rating of appropriateness (former and current view)			
During project appraisal: More efficient provision of drinking water in Nablus		The project objective is to be described as appropriate.			
During EPE (if target modified) is not adjusted					
Indicator	Rating of appropriateness (for example, regarding impact level, accuracy of fit, target level, smart criteria)	Optional PA target level: EPE target level	PA status (Year 2007)	Status at final inspection (2017)	Optional: Status at EPE (2022)
Indicator 1 (PA) Reduction of unaccounted for water	The reduction of unaccounted for water leads to more efficient utilisation of the scarce water resources in Nablus. The indicator is appropriate for the objective, but not possible.	25%	31%	28%	31.9%
Indicator 2 (PA) Reduction in power consumption of pumps in the urban area of Nablus	Energy costs are very high in Nablus. The indicator is appropriate and easily measurable, but not feasible.	0.79 kWh/m ³	0.93 kWh/m ³	0.76 kWh/m ³	0.84 kWh/m ³
Indicator 3 (PA) Supply intervals	The indicator was selected to work towards potentially reducing reduce the supply intervals in Nablus. There are supply intervals of varying lengths in the different supply pressure zones in Nablus. The average value of the duration of supply is of limited significance.	3 days/week	2 days/week	2.3 days/week	2 days/week
Indicator 4 (PA) The water quality complies with WHO standards - Free chlorine, positive - Total coliform, negative - Faecal coliform, negative - Nitrate < 50 mg/l	Indicator is important and appropriate	98%	97.5%	> 99% < 99% < 99% < 20 mg/l	> 99% < 99% < 99% < 20 mg/l

Indicator 5 (EPE) Increase in water consumption	The indicator was added retrospectively during evaluation	Not specified	69 l/p/d	Not specified	82 l/p/d
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Project objective at impact level		Rating of appropriateness (former and current view)			
During project appraisal: The project contributes to securing and improving the health situation of the population of Nablus		The impact objective is important and appropriate. The relationship between the project's objective and the impact objective is assumed to be plausible, but cannot be verified due to the lack of comparable data.			
During EPE (if target modified): Objective is not modified, just one indicator is inserted.					
Indicator	Rating of appropriateness (for example, regarding impact level, accuracy of fit, target level, smart criteria)	Target level PA / EPE (new)	PA status (year)	Status at final inspection (year)	Status EPE (year)
Indicator 1 (PA) No indicators defined	Not specified	No signs of water-induced deterioration in the state of health in Nablus	Not specified	Not specified	Value achieved (after consultation with the hospital in Nablus)

Annex 2: Risk analysis

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

Risk	Relevant OECD-DAC criterion
<p>Implementation risk: Delays, cost increases</p> <p>Risk materialised</p>	Efficiency
<p>Operational risks: insufficient coverage of operating costs</p> <p>Risk partially materialised, operating cost coverage rose from 65% (project appraisal) to 80% at EPE</p>	Sustainability
<p>Yield of replacement drilling Deir Sharaf 2 A remains behind PWA estimates</p> <p>Risk has not materialised</p>	Effectiveness
<p>Deterioration of the population's living conditions due to political or socio-economic developments</p> <p>Risk has not materialised</p>	Impact
<p>Tense financial situation in the city of Nablus, which can lead to limiting of operation of and required maintenance measures for the water supply.</p> <p>This risk has materialised</p>	Effectiveness Sustainability
<p>Deficits in payment practice and collection rate</p> <p>This risk has materialised due to the difficult socio-economic situation in the region</p>	Efficiency Sustainability
<p>Limited water availability, especially with regard to overutilisation of pump capacity, which leads to accelerated technical wear of the machinery.</p> <p>This risk has materialised and will remain high in the future.</p>	Effectiveness Sustainability
<p>The executing agency's lack of commitment to consistently separating the supply pressure zones in Nablus and adequately measuring water consumption hinder the reduction in unaccounted for water.</p> <p>This risk has materialised</p>	Effectiveness
<p>Migration of specialist personnel due to inadequate remuneration.</p> <p>This remains a risk, but is assessed as low.</p>	Sustainability Effectiveness

Annex 3: Project measures and their results

The following physical measures were implemented by the project:

Measure	Unit	Executed
Casting of new transport pipelines DN250—DN350	km	13,253
Construction of new water tank (2 x 1,000m ³ , 1 x 750m ³)	Number	3
Casting of new main distribution pipelines DN90—DN300	km	62,499
Galvanised house connection lines, incl. 1,845 tapping sleeves and accessories	km	28,913
Restructuring of the distribution network into 27 separate pressure zones	---	Yes
Refurbishment of pump stations	Number	13
Delivery, installation and commissioning of motor pumps with output between 4KW and 130KW	Number	35+30
Delivery and installation of electronic flowmeters (DN63—DN300) plus two data loggers	Number	34 + 2
Central control room incl. "SCADA" hardware and programmable logic (software-based) control, structure of the SCADA architecture, incl. the required control, measuring and management equipment, sensors and training of operating personnel	Number	1
Delivery of tools, replacement and wear parts, leak detection equipment, workshop trolleys	Number	1
Delivery line made of ductile cast iron DN 150—DN 300 incl. installation parts and all ancillary work	km	3
Energy-efficient refurbishment of pump stations including pumps, units, measuring and control equipment and necessary structural adjustments	Units	4
Delivery of domestic water meters (1,400 <i>prepaid</i> , 11,500 conventional) and bulk water meters for installation in the pressure zones of the distribution network	5,000 meters have not been installed, are in the warehouse	

The construction work was carried out in a main contract and an addendum. They followed the construction planned at the time and included in the main contract the complete restructuring of the distribution network into supply pressure zones, replacement and installation of pumps, construction of water tanks, expansion and renewal of the main and distribution lines, installation of bulk and final consumption meters, as well as work in the supplementary agreement to separate the pressure zones, construction of network monitoring systems and installation of the control centre (SCADA.) The specific construction measures largely correspond to the measures planned during the project appraisal.

During the commissioning of the new plant, it was found that, in particular, the operation of the installed pumps did not go as planned and instead caused many failures. The reason for this was that the design of the pumps for a continuous water supply was misinterpreted, assuming optimum pressure throughout the network. In order to optimise the operation of the new systems, operational support was provided to the executing agency as part of a training measure that was subsequently introduced. The new consultant Consulaqua created a new model for the water supply system and made necessary adjustments and implemented some of them, in particular adjustments to the operating mode of the pumps and the separation of the pressure zones. However, these have not yet been fully implemented (see Recommendations for operation annex on the next page).

Annex 4: Recommendations for operation

By optimising the day-to-day operational processes within the water and waste water department of the city of Nablus, further potential for reducing losses can be exploited. The recommendations of the project completion report for improving technical operation and thus for improving efficiency have not been consistently implemented.

The project completion report pointed out the unsatisfactory condition of the house connections and the water meters. Although the executing agency is aware that part of the unaccounted for water is caused by the unsatisfactory condition of some of the house connections and water meters, not enough was done to replace the defective house connections and the incorrectly functioning water meters. The city of Nablus wants to achieve adequate water consumption recording by installing prepaid water meters, which is a proper way forward. Nevertheless, 5000 of the 12,000 water meters procured as part of the project are still in the WSSD warehouse. The city of Nablus wants to order the gradual installation of the water meters from external companies. However, no precise time schedule was specified during the EPE.

At the final inspection, the recommendation was made to narrow down the losses in each pressure zone using the data-based system control and detailed logging of the water inventories. With the help of the SCADA system, the water department is able to measure and report on losses within each pressure zone.

The executing agency is able to properly use the equipment supplied by the project to locate the leaks. No documentation has been provided indicating the use of this equipment for preventive maintenance of the system. The installed Geographical Information System (GIS) is maintained by qualified personnel and updated with information. The electronic inventory surveys are not actively used to plan and implement investments in replacing the lines.

Specific measures were proposed during the final inspection to improve the payment practices of end consumers. For example, the implementation of advertising measures in the local media was recommended, as was direct contact with customers who have high outstanding accounts. The advertising campaigns have not been conducted in the long term. The executing agency has set up a single point of contact for all citizens who use a city service. Citizens are denied municipal services if they do not pay outstanding water bills. By actively contacting consumers, collection rates have risen in districts that were previously poorly supplied or not supplied.

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 embedded in the partner country's sector strategy, which aims to improve water supply security in the Palestinian territories. It is closely related to the DC priority "better infrastructure in the water sector".		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?	<p>Sectoral strategies and water/wastewater-related action plans of the Palestinian Authority at the time of the appraisal and during implementation must be reviewed. Role of the Palestinian Water Authority.</p> <p>Ask whether there is a current Federal Ministry for Economic Cooperation and Development (BMZ) country paper?</p>	PP sector section, project manager, Country Manager, regional team (brief political-economic analysis), EIU, 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)?	<p>Water laws, any water-related regulations in the Palestinian territories.</p> <p>Have the demographic changes predicted during the PP occurred in the project area?</p>	PP sector section, project manager, Country Manager, regional team (brief political-economic analyses), EIU, Internet			
Focus on needs and capacities of participants and stakeholders	The water supply is a key need for the population of the project region. The results of the project benefit the entire population. The poorer population groups, who have fewer alternatives for securing drinking water and are directly affected by a deterioration in the water supply, benefit more from the project as they cannot afford the expensive supply using tank trucks.		1	0	
Are the programme objectives focused on the developmental needs and capacities of the target group? Was the core problem identified correctly?	<p>Review the problem analysis of the project and update section 2.1 in the PP with regard to the relevance of the target group, see section 2.09 in the PP and section 2.16.</p> <p>Core problem under section 2.13:</p>	Previous studies, fact-finding missions			

	How was the appraisal prepared? How was the executing agency involved?			
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 are taken into account?	Appraisal report, previous studies		
Appropriateness of design	In principle, the reduction of unaccounted for water is well suited to improving the supply situation.		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?	How was the concept created? How is the design related to the core problems? How was the executing agency involved?	Project report, project completion report, questionnaire, on-site mission		
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 identification of the core problems and the project objectives?	Project report, project completion report		
Please describe the impact chain, incl. accompanying measures. Is this plausible?	Is the impact chain understandable? Is the relationship between the indicators at outcome level and the impact objectives justifiable? No indicators are defined for the impact. The automatism of the effectiveness of achieving the outcome objective on the impact should be critically examined as part of the EPE.	Project report, project completion report, comparable old projects in the region (QUER)		
To what extent is the design of the programme based on a holistic approach to sustainable development (interplay of the social,	How is the general situation of the current scarce water supplies taken into account in the design? How did the tense security situation and the region's economic development affect the project?	PP, fact finding, feasibility study, Water Supply Nablus I		

environmental and economic dimensions of sustainability)?	Does the project have distinct relevance in terms of peace policy? The PP refers to “limited sustainability”. What does this mean in concrete terms – the unachievable cost coverage? How high is the level of ambition – full or operating cost coverage, and was this appropriate? Since sustainability is a key factor at the EPE, is the project’s eligibility for promotion also to be affirmed from the EPE’s perspective despite the limited sustainability?				
For projects within the scope of DC programmes: is the programme, based on its design, suitable for achieving the objectives of the DC programme?	The project was implemented in close cooperation with TC. However, it is not part of the joint DC programme.	Discussions with participants, TE assessment for design			
Response to changes/adaptability	The basic design of the project was not changed during implementation. The increase was necessary due to increased financial requirements. The adjustments – primarily through the use of the training consultant – have had a positive effect on the efficiency of the water supply system.		2	0	
Has the programme been adapted in the course of its implementation due to changed framework conditions (risks and potential)?	What was the existing situation during the appraisal? Has the water supply concept been adjusted? Which technical and institutional adjustments are advisable and carried out in the course of implementation? Have the implementation agreements been complied with?	Consultant reports, reporting			

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 built on WSSD’s capacities developed by TC since 1996. There is a close link between FC and TC in the water sector in Nablus.		2	0	

<p>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)?</p>	<p>Is there interaction within DC in the Palestinian territories and specifically in Nablus and the surrounding area? Does the Federal Ministry for Economic Cooperation and Development (BMZ) have a sector strategy for the Palestinian territories?</p>	<p>PP, reporting, GIZ</p>			
<p>Do the instruments of German development cooperation dovetail in a conceptually meaningful way as part of the programme?</p>	<p>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 irrigation complementary and coherent in the region?</p>	<p>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</p>			
<p>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.)?</p>	<p>How do the measures contribute to achieving which Sustainable Development Goals?</p>				
<p>External coherence (complementarity and coordination with actors external to German DC):</p>	<p>The water sector in the Palestinian territories is highly dependent on donor activities coordinated by the Palestinian Water Authority. The financing capacities of the national authorities and the municipal level are not available to cover the large need for investment. Donor coordination also involves the donors' working group on water, which was co-led by DC until 2016 before this role was transferred to the Netherlands. On a positive note, there is a regional division of labour in the investment projects.</p>	<p>2</p>	<p>0</p>		
<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 water supply network? Are implementation agreements (data collection relating to pressure zones, tariff adjustments, collection rate) adhered to? Have the structural recommendations (e.g. roadmap for an independent water supply and waste water disposal department) been taken into account for the project-executing agency and</p>	<p>Questionnaire to executing agency and from on-site discussions</p>			

	developed together with the municipality of Nablus? And has there been compliance? Has the counterpart contribution been made as agreed?	
Is the design of the programme and its implementation coordinated with the activities of other donors?	How does the project relate to the other measures of other actors?	On-site mission
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?	To what extent is the water and wastewater department of the city of Nablus involved in the design and appraisal? How was the cooperation with other donors during the design and implementation? Have the technical capacities of the partner been used?	Questionnaire to executing agency and on-site
Are common systems (of partners/other donors/international organisations) used for monitoring/evaluation, learning and accountability?	It needs to be investigated whether there are coordination platforms between donors in the Palestinian territories with a specific focus on water management. It should also be found out whether there are nationwide structures for sectoral knowledge management.	On-site

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 (- / o / +)	Reason for weighting
Achievement of (intended) targets	Even though the target values of the indicators have not all been achieved, the objective of a more efficient water supply in the city of Nablus has been partially achieved. Without the project, the water supply in Nablus would be questionable in the long term.		3	0	
Table of indicators: Comparison of actual/target					

<p>Indicator 1 Reduction in unaccounted for water</p> <p>Indicator 2 Reduction in power consumption of pumps in the urban area of Nablus</p> <p>Indicator 3 (PA) Supply intervals</p> <p>Indicator 4 (PA) Outlet water - Free chlorine, positive - Total coliform, negative - Faecal coliform, negative - Nitrate < 50mg/l</p> <p>Indicator 5 (EPE) Increase in water consumption</p>	<p>31.9% (target)</p> <p>0.79 kWh/m³ (target)</p> <p>3 days/week (target)</p> <p>> 99% < 99% < 99% < 20 mg/l</p> <p>82 l/p/d</p>	<p>25% (appraisal)</p> <p>0.93 kWh/m³ (appraisal)</p> <p>2 (appraisal)</p> <p>69 l/p/d</p>			
<p>Contribution to achieving objectives:</p>	<p>Even though the indicators were not fully achieved, the measures of the project were suitable for improving the water supply in Nablus. In particular, the restructuring of the entire system with the introduction of pressure zones and process automation by the control centre, as well as the in-house training of technical staff in order to handle the new demanding supply system, were appropriate.</p>		3	0	
<p>To what extent were the outputs of the programme delivered as planned (or adapted to new developments)? (Learning/help question)</p>	<p>What exactly were the implemented measures? Optimisation of operation with regard to better use of storage and pump capacities was supported by the accompanying training measure.</p>	<p>Questionnaire to executing agency</p>			
<p>Are the outputs provided and the capacities created used?</p>	<p>Are the systems still operating? Are the capacities created from FC funds used in the private or commercial sector?</p> <p>Is the quality of the drinking water regularly monitored? According to which method?</p>	<p>On-site</p>			

	<p>Is the pressure zone concept introduced by the project used? Is a pressure zone-related water inventory created?</p> <p>Is there system management? Is there a properly maintained complaint management system? Evidence of water supply duration? Is the complex water supply system operated in a satisfactory manner? Did the delivery of the water meters contribute to the desired results in terms of water loss reduction? Was the intended reduction in unaccounted for water and the improvement of water extraction achieved? Has the water quality been improved (elimination of leaks and reduction of microbial contamination, residual chlorine content? Hygienically safe drinking water?)</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, tariff adjustment concept, consumption-oriented for the low-income population groups, billing and payment efficiency developing? Have tariffs been raised in the meantime, and if so, by how much? Is it still affordable for the poor population or is cross-subsidisation provided to poor households? What is the situation in the so-called refugee camps, is there water free of charge? Who manages this? Do the "refugees" live together in special neighbourhoods or are they spread throughout the city?</p>	<p>Questionnaire for executing agency, EPE-PP comparison</p> <p>Were the supplied meters also connected? If there was a block tariff, when were meters used?</p>
<p>To what extent did the programme contribute to achieving the objectives?</p>	<p>Have the measures of the project been implemented according to plan, and are the financed facilities operated properly? Would the objectives be achievable without the measure?</p>	<p>Questionnaire for executing agency, PP, project completion report</p>
<p>To what extent did the programme contribute to achieving the objectives</p>	<p>Has the water supply for the target groups improved? How?</p>	<p>Questionnaire for executing agency, >Interviews</p>

<p>at the level of the intended beneficiaries?</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 residents in the old town and refugee camps benefit from the measures.</p>	<p>Interviews with target groups</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>Were meaningful changes applied during implementation? Which ones?</p> <p>The indicators of the water loss reduction project are considered partially achieved. What are the reasons for this? Is the topic of unaccounted for water taken seriously in general, especially with regard to house connections, and addressed proactively by the city (own leak detection unit, number of employees, number of deployments, etc.)?</p>	<p>Project reports, executing agency</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>The specific legal basis for water/waste water is influenced by the Palestinian-Israeli Joint Water Committee. How did the project react to this particular circumstance? What demands did the Israeli side make?</p> <p>What are the current “security” measures of Israelis in the West Bank (checkpoints, night-time curfews, etc.) and how have these influenced the project?</p> <p>How is the general security situation currently (crime, military disputes, violence, etc.) and how has this influenced the project?</p> <p>Security situation during the implementation of the project (key word: Second Intifada, etc.) and impacts on the project.</p>	

<p>Quality of implementation</p>	<p>The measures were carried out in several lots and implemented by local and international construction companies. Although there have been some complaints regarding the capacities of the local companies, the implementation quality is good overall and highly valued by the executing agency. Notably, the executing agency expressed positive opinions about the cooperation with the training consultant.</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>A conspicuous number of construction lots (eight) were put out to tender in the Water Loss Reduction Nablus II project. How should the project-executing agency's planning and implementation capacities be assessed? Have the implementation agreements been complied with? Is the executing agency adequate in terms of design and implementation? Was the executing agency's counterpart contribution helpful in ensuring the necessary building land and licences? Amount of the planned and realised counterpart contribution?</p>	<p>Implementation reports</p>		
<p>How is the quality of the management, implementation and participation in the programme by the partners/sponsors evaluated?</p>	<p>Did the executing agency support the re-organisation of the water supply network according to the concept of pressure zones? How did the cooperation between the executing agency and the consultants develop?</p>			
<p>Unintended consequences (positive or negative)</p>	<p>The more even distribution of available water supplies has led to the calming of water distribution conflicts within the city. Before the project, residents in the higher urban areas often complained that they hardly received any water from the central supply system.</p>	<p>2</p>	<p>0</p>	
<p>Are unintended positive/negative direct effects (social, economic, environmental) identifiable (or foreseeable)?</p>	<p>How did the urban development plans in Nablus develop? Can positive/negative effects be identified, for example with regard to housing prices or visitor numbers? Has the optimisation of the water supply led to relief for residents in their everyday lives?</p>	<p>City of Nablus, local survey</p>		

What potential/risks arise from the positive/negative unintended effects and how should they be evaluated?	The risks of the project are correctly identified in the PP and the project completion report of the project. As part of the EPE, intended and 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.	

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	With specific costs of approx. EUR 86 per person and a consultant cost share of 8%, the production efficiency is rated as satisfactory.		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.	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 TE experience			
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.)?	A striking number of construction and supply lots were necessary to carry out the measures. The division into several lots was justified with the rationale for greater efficiency. Is this also plausible in comparison to similar measures in other countries?	Implementation reports			
Were the outputs produced on time and within the planned period?		Project completion report, consultant reports			

Were the coordination and management costs reasonable (e.g. implementation consultant's cost component)?	Present and question costs.	Comparison with other waste water disposal projects via the QUER portal			
Allocation efficiency	With regard to allocation efficiency, it is difficult to assess the relationship between the input and the achievement of the development policy objective. Due to the limited operating cost coverage from operating income and the executing agency's difficult financial situation, the allocation efficiency is unsatisfactory.		4	0	
In what other ways and at what costs could the effects achieved (outcome/impact) have been attained? (Learning/help question)	The EPE will address this question.	When dimensioning the newly installed pumping power, the consultant assumed an uninterrupted water supply, which expressed itself in an under-dimensioning of the pumps under the specific conditions of the intermittent water supply.			
To what extent could the effects achieved have been attained in a more cost-effective manner, compared with an alternatively designed programme?	The EPE will address this question.				
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?	The EPE will address this question. Was budget planning useful? Are the funds sufficient to achieve the project objectives?				

Impact

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
Overarching developmental changes (intended)	In terms of development policy, the project intends to contribute to securing or improving the health situation in the service area of the water supplier in Nablus. Even though the positive health impact of the improved water		3	0	

	supply is verifiable and plausible, no changes can be identified on site that can be attributed to the project.			
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.)	Have the intended impact effects occurred? Measurable? Have relevant development policy changes occurred for the population of Nablus as part of the implementation of the measures? Did the project have a direct poverty alleviation effect? During the PP, 54% of the target group was poor, 23% was very poor (section 2.21, target group over 240,000 people). Is it possible to illustrate improvements in living conditions?	Official statistics, on-site interviews, studies		
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).	Around half of the beneficiaries are considered poor. During the PP, the population spent up to x of their income on water supply. How is it in 2022, has that improved? What impact of the project can be identified?	City of Nablus, statistics		
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).	Around half of the beneficiaries are considered poor. During the PP, the population spent up to x of their income on water supply. How is it in 2022, has that improved? What impact of the project can be identified?			
Contribution to overarching developmental changes (intended)	The project's contribution to the developmental objective of ensuring or improving the health situation in Nablus cannot be measured. There is a lack of reliable data that would enable precise statements to be made. Nevertheless, it should be noted that the water supply in Nablus would be very unreliable without this project, with corresponding adverse effects on the health of the population. Due to increased leaks, more tank trucks would be required, which would hold the water longer than the water supply system. Particularly at higher temperatures, its drinking water quality is of concern,		3	0

	and the water from the tank trucks is significantly more expensive, meaning that poor people can afford less.				
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?	Would the changes have occurred without the measures? Are they really due to the measures?	A unique contribution analysis cannot be created			
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)	Have the intended improvements in the health of the population occurred and been seen? Is the water quality improved? Did the project have a resource-saving effect?	Study of existing reports, data			
Did the programme contribute to achieving its (possibly adjusted) developmental objectives at the level of the intended beneficiaries?	How has the social and economic situation of the population in the project area developed? Is there reliable data on this?	On-site interviews, statistics,			
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?	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?	Information from interviews with representatives of refugee camps			
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)	Did the restructuring of the entire water supply system in Nablus bring the desired results?	Mission result			
Which external factors were decisive for the achievement or non-achievement of the	How have the aspects mentioned on the right been taken into account by the project?				

intended developmental objectives of the programme? (Learning/help question)					
<p>Does the project have a broad-based impact?</p> <ul style="list-style-type: none"> - To what extent has the programme led to structural or institutional changes (e.g. in organisations, systems and regulations)? (Structure formation) - Was the programme exemplary and/or broadly effective and is it reproducible? (Model character) 	<p>What institutional structures have been established by the project? Are the water and wastewater departments in the city of Nablus adequate to their tasks? Are the management instruments used in the course of the project embedded in the entire structure of water/wastewater 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/wastewater department been implemented? What are the project-executing agency's future challenges?</p>	On-site discussions			
How would the development have gone without the programme?	Would the water supply system be functional and efficient without the project's investments?	On-site analysis			
Contribution to (unintended) overarching developmental changes	No overarching unintended changes can be detected.				
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)?					
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?	Statistical data, City of Nablus, other reports			

<p>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)?</p>	<p>The poverty rate in Nablus is comparatively high. Refugees in refugee camps in particular are considered to be particularly disadvantaged. How did the project affect their situation? Has the project improved their water supply?</p>	<p>World Bank reports, statistics</p>
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Sustainability

<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 (- / o / +)</p>	<p>Reason for weighting</p>
<p>Capacities of participants and stakeholders</p>	<p>The capacity of the project's stakeholders and beneficiaries to ensure the sustainability of results is limited. 80% of the operating costs are covered by operating income (65% at appraisal). Subsidisation by the municipal budget only partially secures financing for proper preventive maintenance of the systems.</p>		<p>3</p>	<p>0</p>	
<p>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>	<p>Has the migration of trained specialists that was identified as a risk materialised? Is the salary structure also appropriate for the private sector? Will the operating concepts for the water supply developed by the project continue to be used? Is the SCADA control room functional? Are the supplied water meters properly installed?</p>	<p>Questionnaire to executing agencies with query about 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>			
<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>The water volumes in the West Bank are scarce and cannot meet demand. Are the population groups willing to bear the costs? How have the water volumes developed in recent years?</p>	<p>WSSD of the city of Nablus</p>			
<p>Contribution to supporting sustainable capacities:</p>	<p>The project has contributed to making it possible to operate the water supply system more reliably. The old inefficient pumps have been exchanged and capacities have been established for monitoring energy consumption and unaccounted for water. As</p>		<p>3</p>	<p>0</p>	

	long as WSSD is part of the municipality, no changes in the financial situation of WSSD can be observed.				
Did the programme contribute to the target group, executing agencies and partners being institutionally, staffing-wise 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? What is the number of employees compared to PP? How has the collection rate developed over the years for waste water and water services? Have the water loss reduction measures identified as necessary been implemented? Is the city willing to commit to this? Has the appreciation of the beneficiaries (results in willingness to pay) developed for "THEIR" water supply system?	Executing agency questionnaire and on-site interviews			
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?	Have there been changes in the behaviour of the beneficiaries, e.g. increased awareness of how to use scarce water sparingly, improved stockpiling measures in the home? Has the economic situation changed for the beneficiaries? Can wage increases be implemented in the meantime? Climate change phenomena such as further scarcity of water resources (almost the entire water supply is dependent on ground water), flooding, etc. visible?				
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. The refugee camps are managed by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA).	Interviews with representatives of refugee camps			
Durability of impacts over time	The concepts developed by the project but not consistently implemented with regard to the clean separation of the designed pressure zones, the adequate measurement		3	0	

	of water consumption and the careful operation of the pumping stations were to be implemented more consistently.			
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? Temperature increases due to climate change and the resulting shortage of water availability are to be anticipated. Are counter-measures apparent?	Study analysis, donor, embassy, etc.		
To what extent is the durability of the positive effects of the programme influenced by the context? (Learning/help question)	Discussions with executing agency, questionnaire			
To what extent are the positive and, where applicable, the negative effects of the programme likely to be long-lasting?	How are the risks that are still present assessed and how is the impact of the project-executing agencies and other institutions assessed? Especially with regard to the limited operating cost recovery ratio, supply efficiency, collection rate, etc.?	Comparison with the implementation agreement (required operating cost coverage for water supply) what exactly was achieved?)		