KfW Development Bank

Ex post evaluation
Water management, central governorates, Jordan

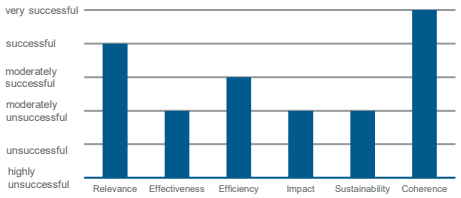
Title	Water management in central governorates		
Sector and CRS code	Water, sanitation and sewage management (14020)		
Project number	2006 66 263		
Commissioned by	BMZ – German Federal Ministry for Economic Cooperation and Development		
Recipient/Project-executing agency	Hashemite Kingdom of Jordan / Water Authority of Jordan (WAJ)		
Project volume/ Financing instrument	EUR 5.3 million, loan under Financial Cooperation		
Project duration	*27/12/2007 – 27/02/2020*		
Year of report	2022	**Year of random sample**	2022

Objectives and project outline

The objective at outcome level was to improve the supply of clean drinking water and hygienic wastewater disposal to the population in the central governorates (Balqa, Zarqa and Madaba). At impact level, the aim was to contribute to economically efficient and environmentally sustainable water resource management.

The project included reducing technical and administrative unaccounted for water by rehabilitating the distribution network, replacing defective house connections, tertiary pipes and (bulk) water meters, measures to protect/rehabilitate a source and establishing a pilot zone to measure the effectiveness of physical rehabilitation measures.

Overall rating:
moderately unsuccessful



Key findings

The project is still highly relevant and was implemented in close cooperation with TC, but the proper operation and maintenance of the implemented measures is insufficient due to a lack of financial resources and operating staff. In addition, no identifiable development policy contribution could be achieved with the low project funds. The project has been rated “moderately unsuccessful” for the following reasons:

- The core problem was addressed correctly and the objectives of the measure were aligned with Jordan’s global, regional and country-specific policies and priorities as well as those of the BMZ. (Relevance)
- However, the project did not lead to the desired water loss reduction in the three governorates; the anticipated improvement in the cost recovery ratio could only be achieved in Balqa. (Effectiveness)
- Compared to the low project volume, the project objectives were clearly defined as too demanding. The relatively broadly diversified project funds also failed to make a tangible contribution to development impact.
- The lack of personnel and the lack of funding from the project-executing agency or operator impairs proper operation and the maintenance of equipment and the network. This became clear at almost all of the sites visited. (Sustainability)

Conclusions

- In principle, the project made a positive contribution to water loss reduction and included some innovative approaches, but the impacts and their sustainability fall short of expectations.
- The selected open programme approach and cooperation with TC (FC/TC cooperation projects) were evaluated as very sensible and recommended by all interviewed participants.
- It is recommended to continue with a holistic, structured approach, generally District Metered Areas (DMAs).
- Administrative and commercial processes should also be included, as well as the regular operation and maintenance of infrastructure to keep unaccounted for water at a low level.

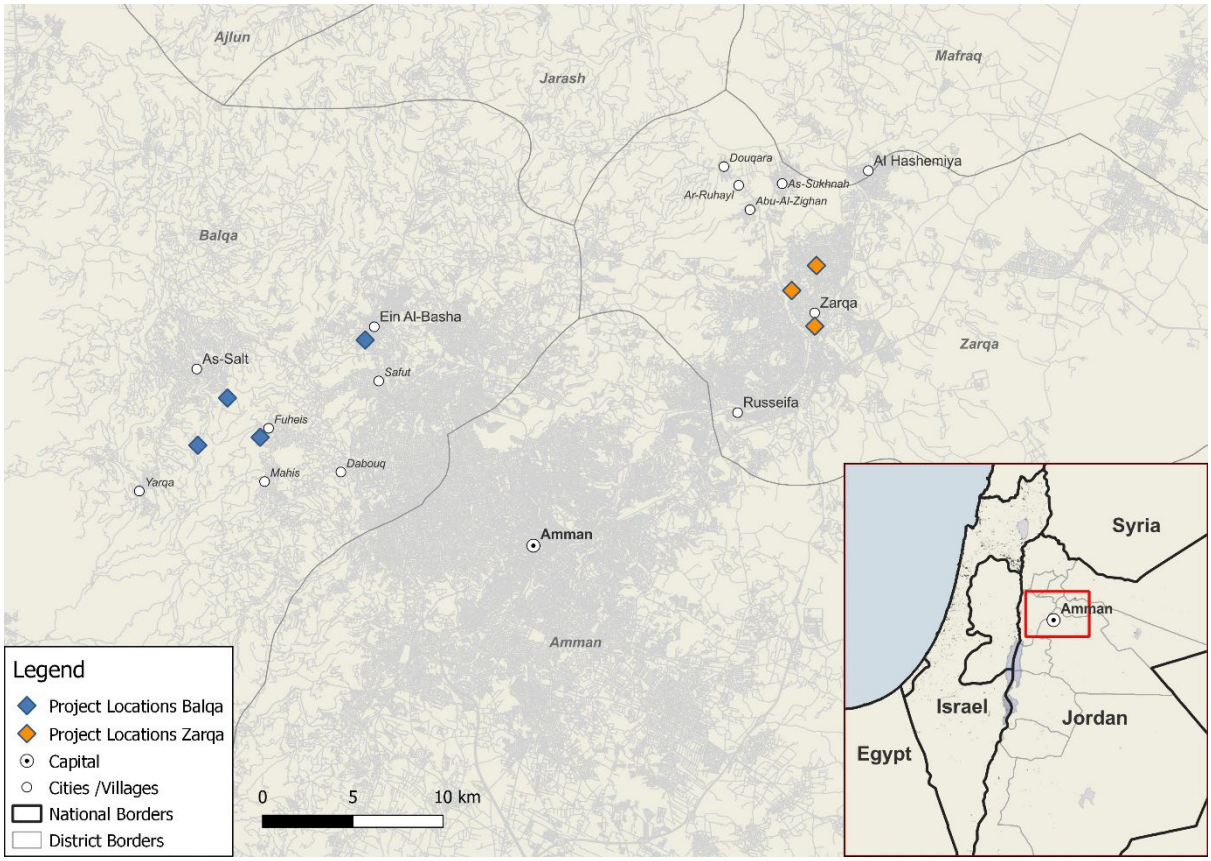
Ex post evaluation – rating according to OECD-DAC criteria

Brief description of the project

The “Water Management of Central Region Governorates” (WMG) project included the financing of priority investment measures to improve the quality of service and increase the efficiency of local water administrations in the Central Region governorates of Balqa, Zarqa and Madaba. The aim was to improve the population’s supply of clean drinking water and contribute to economically efficient and ecologically sustainable water resource management. The project was an FC/TC cooperation project coordinated with GIZ.

The project-executing agency was the Water Authority of Jordan (WAJ). At the time of the project appraisal, the local WAJ administrations were responsible for the water supply in the three governorates. However, responsibility for the operation of water supply and wastewater disposal in the governorate of Madaba (October 2013), Zarqa (January 2015) and Balqa (2021) was successively transferred to the public water utility “Miyahuna”.

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



Source: own data

Breakdown of total costs

		Inv. (planned)	Inv. (actual)	Accompanying measure (planned)	Accompanying measure (actual)
Investment costs (total)	**EUR million**	**8,150,000**	**8,150,000**	**n/a**	**n/a**
Counterpart contribution	EUR million	2,850,000	2,850,000	n/a	n/a
Debt financing	EUR million	5,300,000	5,300,000	n/a	n/a
Of which BMZ funds	*EUR million*	*5,300,000*	*5,300,000*	n/a	n/a

Rating according to OECD-DAC criteria

Relevance

Policy and priority focus

The objectives of the programme are 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. The project aims to achieve efficient and sustainable management of scarce water resources and thus contributes to achieving Millennium Development Goal (MDG) No. 7 (Resource conservation) and the Sustainable Development Goals (SDG), in particular to improving water quality and the efficiency of water consumption (SDG 6) and to climate change adaptation (SDG 13). It is also in line with the development policy priorities of the German Federal Government and the partner country. The project supports the sectoral objectives set out in the Jordanian Water Action Plan, which are also included in the water priority area strategy paper, which runs until 2010.

A common strategic objective of DC was and is to secure integrated economic, environmental and socially sustainable water resource management through the efficient use of renewable resources, as defined in the FC/TC water priority report from 2007 and in the priority area strategy paper 2006–2010. The focus here is on economic efficiency and social justice (target level: utilities providers, improvement of cost coverage and improved efficiency as well as service quality) and environmental sustainability (protection of groundwater resources from overuse). The project was intended to contribute to this by financing priority investment measures to improve the quality of service and increase the efficiency of local water administrations in the Central Region governorates of Balqa, Zarqa and Madaba.

The above-mentioned objectives continue to be relevant in the context of Jordan's 2016–2025 water strategy, which among other things aimed to cover the operating costs for the WAJ until 2020 (current executing agency analysis WAJ), although this has not been achieved to date.

At the time of design (preparation of the project appraisal in 2006), the project addressed a core problem of drinking water management in the three governorates: the high level of physical and administrative unaccounted for water (*non-revenue water*, NRW) and the poor quality of service provided by the utilities providers. NRW figures were estimated to be high 51% in Balqa and Zarqa and 41% in Madaba, with administrative losses estimated to be 30% in Balqa and Zarqa and 20% in Madaba. With a connection rate of almost 100% to the drinking water supply, the 1.5 million inhabitants in the three governorates (target group) only had access to water on average 2 to 3 days a week at the time of the appraisal. The main cause of technical unaccounted for water was identified as leaks in the water pipeline network and a lack of maintenance of the network, in particular the tertiary network, as well as defective house connections. The lack of performance incentives in the tender and the implementation of rehabilitation measures, as well as overwhelmed management in the WAJ administration of the governorates also contributed to the high rates of unaccounted for water. There were also significant weaknesses in the water extraction area, both in sources and wells. Problems in the operation and maintenance of the wells led to high energy costs and at the same time to limited performance and yield of the wells, while many sources are contaminated due to inadequate protective measures.

Since the project included measures to increase operating cost coverage and improve the reliability of the drinking water supply, commercialisation and decentralisation of the water supply in the governorates were required. The project proposal describes the current state of commercialisation and decentralisation as follows: "Both the centrally organised WAJ and decentralised, semi-autonomous operators are active in the area of operating the

water supply and wastewater disposal systems. In Amman, the Jordanian Water Company Miyahuna is responsible for the operation of the systems, in Aqaba the Aqaba Water Company and in the northern governorates the Northern Governorates Water Administration (NGWA) with a managing consultant. In all three operating companies, WAJ is the sole or majority owner and still exercises influence over the corresponding committees (supervisory board, etc.). Autonomy can therefore be assessed as limited, whereby the presence of other actors in the supervisory bodies has led to a certain reduction in the influence of the owner WAJ." Against this background, the gradual transfer of water supply and sewage disposal to the central governorates Madaba (2013), Zarqa (2015) and Balqa (2021) to the water utility Miyahuna is to be regarded as an important sectoral step. However, it is questionable to what extent Miyahuna, as a subsidiary of WAJ, can act autonomously and with economic independence. To date, Miyahuna's financial and organisational scope seems to be essentially limited to day-to-day business. The WAJ and Jordanian Ministry of Water continue to exercise political control, for example over major investment decisions (which are generally not made by the utilities providers themselves anyway) and the staffing at management level.

Focus on needs and capacities of participants and stakeholders

The project's target group is the population of the three Central Region governorates (Balqa, Madaba and Zarqa) with around 1.5 million inhabitants. The objective at outcome level is to improve the supply of clean drinking water and hygienic wastewater disposal to the population in the central governorates (Balqa, Zarqa and Madaba). The project concept is geared towards the needs and capacities of those involved and those affected by the reduction of physical and administrative unaccounted for water, which enhances the cost coverage and the quality of service of the water supplier and thus leads to a quantitatively and qualitatively improved drinking water supply for the target group. Reducing unaccounted for water also aims to conserve scarce water resources. As a result, improving the quality of service and increasing the efficiency of local water administrations in the central governorates of Balqa, Zarqa and Madaba is the appropriate means to achieve the goal of improving the supply of clean drinking water to the population in the central governorates (Balqa, Zarqa and Madaba).

The impacts of the individual measures are indirectly geared towards the development policy needs and capacities of the target group and were appropriately taken into account by the project measures designed. Essentially, the measures aim to improve the service quality and commercial performance of the local WAJ administrations in the central governorates. The operators/water utilities and the water infrastructure thus represent the direct target group of the measures. The population in the three governorates was ultimately to benefit from an improved water supply, which was to be achieved through greater performance and a reduction in unaccounted for water (more water that arrives in households and increased drinking water quality due to lower dirt deposits in defective pipelines). The reduction of technical and administrative unaccounted for water in the pipeline network through the programme measures should ultimately lead to more water being available to the target group. The individual measures under the project were also chosen in such a way that they contribute to improving the service quality and commercial performance of the local WAJ administrations in the central governorates, which should indirectly contribute to improving the supply of clean drinking water and hygienic wastewater disposal to the population in the central governorates.

The project did not take into account the needs and capacities of particularly disadvantaged or vulnerable sections of the population through specific measures. However, it was assumed that households with low incomes in particular, which have smaller storage capacities in their homes, will be less dependent on the purchase of significantly more expensive tanker water if supply intervals are extended. It was therefore assumed that the budget of low-income households would be disproportionately relieved. Against this background, a comprehensive socio-economic baseline survey was carried out, which gathered quantitative and qualitative data on the target group's living situation and was submitted in 2008. However, it was not apparent that the criterion of poor or vulnerable groups was decisive when selecting the individual project measures, although this was mentioned in the special agreements.[1] Compliance with the criterion for focusing on poorer neighbourhoods formulated in the separate agreements for the selection of measures is therefore not verifiable. Ultimately, the urgency of the water loss reduction measures in individual network sections was decisive as an essential criterion of the individual project measures, which was also referred to in the project proposal ("The individual measures are to be selected in such a way that they contribute to improving the service quality and commercial performance of the local WAJ

[1] "In the case that measures are considered to be included in the project, which are technically and commercially comparable, priority shall be put on measures which have the highest positive impact on the living conditions of poor customers in the supply area. The results of the ongoing baseline survey study shall be considered in this process. This study shall also be used to assess the expected poverty impacts of the selected measures and, where necessary, supplemented by specific customer surveys before and after their implementation."

administrations in the central governorates."). In retrospect, these primarily economic-financial criteria for selecting the individual measures are sensible and comprehensible, as they can achieve the greatest possible impact with the comparatively low project funds.

At the same time, the socio-economic survey has shown numerous results on poverty rates in the three governorates, which justify the fundamental selection of the three governorates.[2] This is integrated into the basic logic of selecting the three governorates – at the time of the project proposal, previous DC projects were first implemented in the Amman area and then in the northern governorates of Irbid, Jerash, Ajloun and Mafraq. At the time of the project proposal, around 2.8 million people, i.e. more than half of Jordan's population, lived there. In the governorates of Irbid and Mafraq in particular, an above-average proportion of poor people was reached in accordance with their population structure. Similar to the northern governorates, the evaluated project was then implemented in the central governorates of Zarqa, Balqa and Madaba. Until then, no drinking water projects had been implemented in the project area.

Appropriateness of design

The technical and organisational design of the programme can be described as appropriate and realistic (technically, organisationally and financially) under the given implementation conditions. Against the background of the above-mentioned core problem, the project included measures to reduce technical and administrative unaccounted for water in the three governorates – in particular by rehabilitating the distribution network, replacing defective house connections, tertiary lines and installing (bulk) water meters, measures to protect/rehabilitate a source, the establishment of a pilot zone including data collection to measure the effectiveness of physical rehabilitation measures and associated consultant services. By reducing physical unaccounted for water, more drinking water should be available and drinking water quality should be improved (less dirt deposits in defective pipelines). From an organisational point of view, the design of the programme also makes sense, as WAJ, as the project-executing agency, is responsible for implementing the measures. In financial terms, however, with the low commitment amount of EUR 5.3 million, only selective measures could be implemented, meaning that their impact on the overall sector can inevitably only be small. It must be noted critically here that the project objectives set can/could hardly be achieved at the aggregate level of the three governorates with the project funds used.

From today's perspective, the project's impact chain can also be described as plausible: Individual financed measures are intended to reduce the NRW, thereby improving the cost coverage, service quality and performance capacity of the local WAJ administrations and water utilities. This improves the quality and quantity of the drinking water supply for the population. Ultimately, water savings are achieved by reducing NRW and thus protecting water resources, which contributes to sustainable water resource management.

The FC measures were mainly aimed at reducing technical unaccounted for water; the reduction of administrative losses was to be achieved primarily through close dovetailing with the TC project "Central Governorates" with the programme component "Operation and Management Support in Water Supply and Sanitation in the Central Governorates" (in short: "Operation Management Support", OMS, see section on coherence). However, the installation of new water meters financed as part of the FC project (reduction of water theft) also contributed to reducing administrative unaccounted for water. At the time of the design, no DC programme existed.

The design of the programme is fundamentally based on a holistic approach to sustainable development and accordingly targets the social, environmental and economic dimensions of sustainability, which are also included in the impact chain. However, social sustainability is defined as the improvement and reliability of the drinking water supply and could exceed this from the perspective of the evaluation (e.g. effects on improving general living conditions). It is worth highlighting that a comprehensive socio-economic baseline survey of the target group was conducted in advance, as this is not usually a standard in DC projects.

Response to changes/adaptability

The programme was adjusted in the course of its implementation due to changed framework conditions. For example, the residual funds of EUR 766,914.53 from the project for the partial financing of the component Ain

[2] "22.3% of the population of Zarqa, 17.8% of the population of Balqa and 10.7% in Madaba lived below the poverty threshold (14.2% in Jordan nationwide) in 2002/2003 according to the Jordan Poverty Assessment, which was by definition JOD 388 per capita per year in Zarqa, JOD 365 in Balqa and JOD 377 in Madaba. This corresponds to an average for the three governorates of around JOD 377 (EUR 396), which is therefore higher than the national average of JOD 313 (cf. note 2.02). The poverty rates within the governorates fluctuate significantly. Three sub-districts located in the Zarqa governorate (Al Dhlail, Beerain and Al Azraq) have exceptionally high poverty rates of 52.42% and 40% and are among the 13 poorest sub-districts in Jordan (Poverty Pockets)."

Basha & Safout (construction lot C2) were used as part of the project “Water loss reduction, Central Governorates” (WRMP I; BMZ no.: 2008 66 251) (final inspection 2019). The remaining funds for this component amounting to EUR 2.75 million were financed from WRMP I. This use of residual funds makes sense and is integrated into the project design.

The project was implemented as an open programme, i.e. the individual measures were determined during implementation in consultation between KfW and WAJ on the basis of defined priorities. The open approach allowed flexibility to adapt the measures to the underlying conditions and to choose the individual measures according to the project-executing agency’s priorities and in cooperation with the TC project.

Summary of the rating:

The relevance of the project remains high. The project supported the sector objectives formulated in the Jordanian water action plan at the time of the project appraisal, which were also included in the priority area strategy paper “Water focus” of the German-Jordanian cooperation (2006–2010). The development and strengthening of water infrastructure and investments in programmes to reduce physical and administrative unaccounted for water, which aim to increase the cost coverage of Jordanian water utilities, among other things, are goals of the 2016–2025 national water strategy. From both the perspective of the time of the appraisal and from today’s perspective, the measure addressed this core problem. Access to a secure, affordable and adequate water supply for all Jordanians and the sustainable management of scarce water resources was and remains an important strategic goal of the Jordanian government and of German-Jordan development cooperation.

Relevance: Successful (2)

Coherence

Internal coherence

This project was conceived and implemented in close cooperation with GIZ, in particular with regard to the above-mentioned OMS GIZ programme for the WAJ in the central governorates. To enable close coordination and create synergies, the same implementation consultant was used for both the KfW and the GIZ projects. As suggested in the project appraisal report, the executing consulting consortium was directly commissioned to obtain synergy effects with the TC’s OMS programme. For example, the TC component provided technical support via the consultant to WAJ administrations and the FC component was in charge of corresponding investments. Against this background, the TC water programme and the FC project were managed as FC/TC cooperation projects.

The TC component was intended to provide technical support to the corresponding WAJ administrations in the three governorates and finance the FC component for corresponding investments. Specifically, the TC measures mainly aimed to improve WAJ’s service quality and performance capacity through operational and management consulting. The reduction in administrative unaccounted for water also included an improvement in billing and collections. As part of the TC programme, measures to increase customer satisfaction and service quality were also implemented. In principle, it makes sense to closely link FC and TC as part of a cooperation project. The cooperation between TC and FC was rated as very good, complementary and expedient by all stakeholders interviewed.

The instruments of the German development cooperation dovetail in a conceptually meaningful way as part of the programme. The cooperation within the scope of the project between KfW and GIZ was rated as constructive and successful by both KfW and GIZ as well as the implementation consultant. The WAJ also assessed the interaction of FC and TC instruments as fundamentally constructive and expedient. Only the timing and harmonisation of TC and FC processes was perceived as challenging by GIZ.

The programme is generally consistent with international norms and standards acknowledged by German DC.

External coherence

In the context of donor coordination, close dialogue (and exchange) took place between donors active in the water sector. In the National Water Strategy 2016–2025, Jordan aimed to cover the operating costs for the WAJ until 2020, but this has not yet been achieved. The project thus supported the partner country’s own efforts.

In view of the current operating cost recovery ratio, it must be stated that in individual cases operation and maintenance cannot be adequately carried out by the WAJ and the water utilities. FC continues to try to counteract this together with the BMZ and the embassy in the sector dialogue. Other donors, including the World Bank, AFD, EIB and JICA, are also active on this issue. In addition to KfW, USAID is one of the most important donors and supports commercialisation processes in Amman and Aqaba and finances national investment projects aimed at renovating/expanding water supply networks and reducing unaccounted for water. Under the Millennium Challenge Corporation (MCC) and the FARA project financed by USAID, projects to reduce unaccounted for water are also financed in the central governorates. For example, the pilot zone set up as part of the project in Zarqa was adapted and expanded by the MCC and FARA projects. During the mission, Miyahuna explained that the pilot zone in Zarqa financed under the WMG project formed the conceptual basis for the insulation and sectorisation of further water networks in Zarqa under MCC and FARA.

Summary of the rating:

The coherence is rated as high. This project was conceived and implemented in close cooperation with GIZ, in particular with regard to the OMS GIZ programme for the WAJ in the central governorates. To enable close coordination and create synergies, the same consultant was used for both the KfW and the GIZ projects. The cooperation between KfW and GIZ was rated as constructive and successful by both KfW and GIZ as well as the implementation consultant. The WAJ also assessed the interaction of FC and TC instruments as fundamentally constructive and expedient.

Coherence: Very successful (1)

Effectiveness

Achievement of (intended) targets

The project objective (outcome level) defined during the project appraisal was to *improve and guarantee a secure supply* of clean drinking water and hygienic wastewater disposal to the population in the central governorates (Balqa, Zarqa and Madaba). However, the interventions did not contribute to hygienic wastewater disposal. The project proposal states that more extensive measures in the wastewater sector are only to be carried out in a future phase, but this has not been implemented. Since no measures were implemented in this regard, the evaluation mission did not consider hygienic wastewater disposal to be part of the project objective.

Against this background, the proposed objective adjusted as part of the EPE was to *improve and guarantee a secure supply* of clean drinking water for the population in the central governorates (Balqa, Zarqa and Madaba).

The target achievement at outcome level is summarised in the table below:

Indicator	Status during PA	Target value PA/EPE	Status PA (2006)	Actual value at final inspection (2014)	Actual value at EPE
Indicator 1 (PA)	Reduce technical and administrative unaccounted for water by 5 percentage points by 2010	-5 percentage points	Balqa 51% Zarqa 51% Madaba 41%	Balqa 62% (+11) Zarqa 59% (+8) Madaba 62% (+21)	Balqa 62.5% (+11.5) Zarqa 53.5% (+2.5) Madaba 42.4% (+1.4) Value not achieved
Indicator 2 (PA)	Increase in operating cost coverage by at least 10 percentage points by 2010	+10 percentage points	Balqa 63% Zarqa 73% Madaba 66%	Balqa 49% (-14) Zarqa 70% (-3) Madaba 45% (-21)	Balqa 76.7% (+13.7) Zarqa 81% (+8) Madaba 70% (+4) Value partially achieved (Balqa)
Indicator 3 (PA)	Improvement of the reliability of the drinking water supply and service quality as a result of customer	N/A	Results from customer satisfaction study 04/2008:	Results from customer satisfaction study 04/2009:	According to current data from the final inspection, the last results of the customer satisfaction study are

	surveys at the start and end of the project by the consultant of the OMS project or the baseline survey that will soon begin[3]		Satisfied with water volume: 49% Satisfaction with WAJ service: see below	Satisfied with water volume: 78% (Satisfaction with the quantity of water rose on average from 49% to 78%); Satisfaction with WAJ service: Complaints about the service quality of the WAJ service centres fell in Fuheis, Dhiban, Madaba. It increased in Salt, Roussiefa and Zarqa.	from 2009; however, the project was implemented by 2014. It can therefore be assumed that the results (increased water volume & customer satisfaction) are not attributable to the project measures.

Contribution to achieving targets

The measures were implemented as planned, but the indicators were largely not achieved.

Based on the discussions and site visits carried out in Balqa and Zarqa, it can be stated that the outputs and capacities provided are mainly used. However, the flowmeters installed as part of the project were installed in *Zarqa* (as already noted in the final inspection report), but were no longer used because the *pilot zone* set up as part of the project was changed in the meantime (see "Sustainability" for further details).

The following factors affected the achievement of the project indicators:

Indicator 1

- Technical and administrative losses have increased in all governorates compared to 2006, but have decreased at least in Zarqa and Madaba (though slightly increased in Balqa) compared to 2014.
- The supply of water from the Disi aquifer since 2012 has increased water availability, but also the pressure in the water network in all three governorates, which has a negative impact on the load and NRW of the water network.
- Illegal water theft is estimated to have a significant impact on the NRW in all three governorates.
- It is likely that unaccounted for water is also the result of old, dilapidated pipes that are not completely disconnected from the water network. Since there is no overview and no comprehensive knowledge of all old lines in the Jordanian network, these will only be separated during new projects if lines are renovated/newly laid.
- Many domestic water meters do not function properly (administrative losses should be reduced by functioning domestic water meters).

Indicator 2

- Although the indicator could not be fully achieved, the cost recovery ratio in all three governorates has risen since 2006. One of the main reasons for this is that Miyahuna has taken over management of WAJ operations in all three governorates. In Balqa, the cost recovery ratio even rose by 13.7 percentage points compared to 2006, meaning that the project indicator for 2021 has been achieved.
- Rising energy costs for water utilities, accounting for 50–60% of operating costs, mainly caused by high pumping costs for groundwater, which is the main water source in the three governorates, as well as long pipelines, e.g. to pump water from the Disi aquifer to Amman.

[3] From final inspection: "No targets were set for this indicator at the start of the project. As part of the project, three customer satisfaction studies were carried out, which were to provide information about the changes every six months. Satisfaction with the quantity of water rose on average from 49% to 78%. No reasons are given for this. In most of the locations surveyed, complaints about water quality decreased; in Zarqa and Salt they increased. Satisfaction with the service quality of the WAJ service centres fell in Fuheis, Dhiban, Madaba. It increased in Salt, Roussiefa and Zarqa. It should be noted that only a very small sample was surveyed within very short intervals. It is unlikely that the effects of the project were recorded in such a short time."

- Increase in water demand due to population growth, accelerated by refugees, especially from Iraq and Syria, which is exerting steadily increasing pressure on the water sector in general and on water utilities. In addition to the increasing demand for water, the refugee crisis is manifesting itself in an increase in operating, management and maintenance costs on the supplier side, which cannot be covered by proportionally rising tariffs.

- The objective of the TC component was to increase the operating cost coverage of the newly established water companies in the central governorates from 70% (2007) to 100%. The target achievement of the TC component should be reflected in project indicator 2 of the FC project. The promotional components of the TC measure included process and specialist advice from international, regional and local long-term and short-term specialists, contributions in kind (IT equipment, vehicles, equipment for water operators) and further training measures. Financing contributions were used to finance measures in the water and wastewater supply sector. However, according to reporting, the figure fell to 53% by 2015. The rationale for this is primarily the ongoing influx of Syrian refugees and the constantly increasing pressure on water supply and wastewater disposal companies. The continuously disproportionately high energy and wage costs were not allocated to the water tariffs and were therefore not passed on to customers. Another key cost driver was the purchase of Disi water or the subsidisation of the associated actual costs, which are also not passed on to customers. The northern and central governorates were particularly affected, in which the majority of Syrian refugees live in host communities.

Indicator 3

- No targets were set for this indicator at the start of the project. As part of the project, three customer satisfaction studies were carried out, which were to provide information about the changes every six months. Satisfaction with the quantity of water rose on average from 49% to 78%. No reasons are given for this. In most of the locations surveyed, complaints about water quality decreased; in Zarqa and Salt they increased. Satisfaction with the service quality of the WAJ service centres fell in Fuheis, Dhiban and Madaba. It increased in Salt, Roussiefa and Zarqa. It should be noted that only a very small sample was surveyed within very short intervals. It is unlikely that the effects of the project can be recorded in such a short time.
- The latest data on the customer satisfaction study was from 2009; more recent figures could not be fully determined. Upon request to WAJ/Miyahuna, the number of customer complaints was stated for all three governorates, but only for the years 2020 and 2021. Data for the years between 2009 and 2020 is not available. Therefore, sufficient reproducibility cannot be established. The most detailed customer complaints were presented for the governorate of Zarqa, for which complaints increased from 2020 to 2021, mainly due to complaints about lack of water and about (visible) leaks.
- Several households were surveyed during the on-site visits. The surveyed households were generally happy with the intermittent water supply (1–2 days per week), even though there may be water shortages in households with a low storage capacity in the summer months. For a household of four to five people, the water costs of JOD 8–15 per quarter seem affordable. The biggest challenge seems to be the limited water supply in the summer months, when many households have to purchase additional water, which is mostly supplied in tankers by private companies (with up to ten times higher costs per m^3 compared to Miyahuna). A continuous water supply would, of course, be desirable, but would not seem feasible in Jordan under the given conditions.

Due to the lack of reliable data for the baseline and current data at governorate level, the validity of the available data on the effectiveness of the project interventions is limited. Furthermore, it can be assumed that many external factors, e.g. interventions by other donors in the project area, additional drinking water from the Disi aquifer since 2012 and the high number of Syrian refugees since 2011/2012, have significantly affected the project objectives. However, in our opinion, the actual effectiveness of the project can only be assessed to a limited extent based on the information and data available. In general, all interviewees noted that the data for non-revenue water (NRW; technical and administrative unaccounted for water) in most Jordanian governorates, including the three central governorates, is unreliable, as no qualified water inventories have been established to date.

The isolation of certain zones into smaller, district-metered areas (DMA) to locate unaccounted for water and implement specific measures has only been introduced in recent years. Therefore, measures to reduce unaccounted for water were mostly not taken on the basis of reliable information about the water network, but on the basis of ad hoc needs in the water network. Without reliable information on water inputs and outputs, it is hard to identify physical and administrative unaccounted for water or NRW and to evaluate the impact thereof, especially

at aggregated level (government level). Alternatively, the number of customer complaints and/or the frequency of repairs in the water network can be an indicator of the condition of the network and provide an indication for NRW. In Madaba, repairs to main lines and service connections decreased from 6,104 in 2014 to 4,716 in 2021. The data for Zarqa and Balqa were only presented in 2021 and are therefore not comparable with previous years. Therefore, the informative value of the baseline data and the project indicators for WMG, which were estimated at the level of the three governorates (and not at DMA level), is only of limited informational value for the assessment of the overall achievement of the project's objectives.

It should also be noted that direct impacts of the financed measures at outcome level are difficult to verify now, as numerous other interventions (both from other donors and from the executing agency's own funds) have taken place in the project area since the measures were completed in 2014. On the other hand, in the case of WMG, WAJ was the project-executing agency until the project was completed, but since the measures were completed, the operational management has been gradually taken over by Miyahuna. Representatives of the WAJ were therefore unable to name any personnel who had supported the implementation of the project and were still working at the WAJ. In addition, the representatives of the WAJ were not familiar with the details of the project, as there appears to be no adequate knowledge management/storage or a deficient transfer of project information at WAJ level. Project-specific locations and measures could only be identified with the active support of the implementation consultant and a former WAJ employee (now at Miyahuna).

Compared to other projects in the sector, the target values of the indicators are set low, as the relatively low commitment amount for Phase I means that only selective measures are implemented, meaning that their impact in relation to the aggregated level can inevitably only be low. Although it can generally be assumed that the measures had a positive effect (water loss reduction measures are no-regret measures), from the perspective of the EPE the target values were still too ambitious, measured against the low investment volume.

Quality of implementation

The project was carried out on site by the project-executing agency supported by a project team of the consultant. In addition to an international project manager, several local and international specialists were deployed in both long-term and short-term assignments. Overall, the consultant closely supervised the identification, design, tendering and construction supervision of the measures and there were no unusual difficulties in the implementation. The implementation consultant cited the different departments and implementation units of WAJ as a fundamental challenge for the implementation, some of whose responsibilities overlapped. The responsibility of a "Project Management Unit" (PMU) set up for the implementation of WMG significantly improved the allocation of responsibilities according to the consultant. At the same time, several lots had to be tendered again, as local companies did not apply for large lots due to insufficient capacity. These delays in tendering and awarding contracts are ultimately one of the main reasons for the project delays (55 months instead of 36). As a learning effect, tenders were split into smaller lots to accommodate the capacity of local companies, which was ultimately successful.

These findings from the evaluation largely coincide with the results of the final inspection. In this report, the quality of the implementation was rated as largely satisfactory, although there were delays in implementation, mainly due to lengthy tendering and awarding procedures as well as the strained financial situation of the WAJ. In addition, the own funds for contracts 8 and 9 were not secured for a long time. According to the final inspection part II, the quality of the work was also rated as satisfactory to sufficient. As already noted in the final inspection reports, the risks were primarily identified in operation during the evaluation mission.

Unintended consequences (positive or negative)

No unintended effects were identified.

Summary of the rating:

We rate the effectiveness of the project as moderately unsuccessful, as the project indicators for achieving the project's module objective were largely not achieved. The technical and administrative unaccounted for water increased in all three governorates compared to 2006; the improvement in the operating cost recovery ratio of the WAJ and Miyahuna by 10 percentage points could only be achieved in Balqa, although the operating cost recovery in all three governorates improved compared to 2006. There is no information available about the satisfaction of end customers that would allow conclusions to be drawn about developments in recent years (data on

customer satisfaction could only be provided for 2020 and 2021, which means that sufficient reproducibility cannot be established).

Only in recent years have DMAs been set up with the support of donors, which can provide more reliable basic data for NRW in the respective DMAs. Therefore, the informative value of the baseline data and the project indicators for WMG, which were estimated at the level of the three governorates (not at DMA level), is only of limited informational value for the assessment of the overall achievement/effectiveness of the project. In principle, no evidence of a negative impact of the implemented project measures on the project objective could be identified during the mission. However, the target values were clearly set too high in comparison to the low (and widely spread) project funds. We therefore conclude that, although the measures implemented have contributed positively to the project objectives, the project objectives have not been achieved on the one hand and, on the other hand, the project measures have not had any noticeable impact at the aggregated level.

Effectiveness: Moderately unsuccessful (4)

Efficiency

Production efficiency

In general, there are not any more cost-effective alternatives to the measures implemented.

The implementation period of the project was extended from the originally planned 36 months from the commissioning of the consultant (2008–2010) to 55 months, mainly due to the above-mentioned delays in tendering and awarding procedures. For the implementation consultant, this delay resulted in cost implications, but the total consulting costs still seem reasonable compared to the total costs of the project, at around 15% of the total costs.

In the opinion of the implementation consultant, the original idea of tendering the project measures via specific award regulations of the PMU set up for the project led to a delay in awarding the contracts rather than the expected acceleration. For this reason, both WAJ and the consultant recommend using the usual procurement procedures within the PMU or WAJ. Furthermore, the consultant explained that several project measures had to be re-tendered because local companies could not meet the capacity criteria and international companies were not interested in the tenders. Therefore, the tenders were split into smaller lots, which more closely corresponded to the capacity of the local suppliers.

Allocation efficiency

Overall, the evaluation does not provide any evidence of cheaper alternatives. The project measures adequately aimed to reduce both physical and administrative unaccounted for water. Given the limited specific investment costs of only around EUR N5.3 per inhabitant (EUR 8.15 million and 1.5 million residents in all three governorates in 2006) the chosen approach to reduce physical and administrative water losses where they are technically and economically most urgent was appropriate and efficient. For future project activities and with higher funding, a holistic approach seems to be more efficient, involving isolating sub-areas/DMAs and thus concentrating on smaller distribution areas instead of selective measures throughout the governorate. This approach has already been taken up in recent programmes such as by KfW and USAID.

As a complementary perspective on the possible increase of potential positive impacts with existing resources, binding economic and financial criteria for the selection of individual NRW measures could be established with the executing agency (in the Separate Agreements) in the future.

Summary of the rating:

With regard to efficiency, more cost-effective alternatives are generally not identifiable. In summary, efficiency is rated satisfactory. The project measures adequately aimed to reduce both physical and administrative unaccounted for water. Given the limited specific investment costs of only about EUR 5.3 per inhabitant, the approach applied, which targets the physical and administrative unaccounted for water where it is most technically and economically urgent, was appropriate and efficient. However, taking into account these very low specific investment costs, no significant water loss reduction could be expected. For future project activities and for higher financing, a holistic approach is advisable, which includes the isolation of sub-areas/DMAs and thus the concentration on smaller distribution areas instead of selective measures throughout the entire governorate. This approach has

already been taken up in recent programmes, for example by KfW and USAID.

Efficiency: Moderately successful (3)

Impact

Overarching developmental changes (intended)

The overarching development objective (impact) defined during the project appraisal was to contribute to economically efficient and environmentally sustainable management of the country's scarce water resources. The assumption of the project was that a reduction in the NRW would lead to an improved drinking water supply, which in turn would contribute to the efficient and sustainable management of water resources.

However, the formulation of indicators for the impact level was dispensed with in the project design because it was assumed that the achievement of the objectives at impact level is automatically deemed to be achieved if the objectives of the outcome level were met. In principle, it would have been possible to introduce another indicator at impact level, e.g. improvement in the health situation through improved water supply. However, this is not considered mandatory, as the above-mentioned impact assumption of the project seems reasonable.

Contribution to overarching developmental changes (intended)

According to Miyahuna, water production in all three governorates has increased from 67 million m^3/year in 2006 to 75.2 million m^3/year (2021) since the programme appraisal. However, renewable water resources per capita per day in Jordan have fallen from 160 m^3 per capita per year in 2006 to below 100 m^3 per capita per year in 2021. The main reason for this is the nationwide growth of the population, which increased from around 6 million to over 10 million people in the same period. In the three central governorates, the population has risen within 11 years from approx. 1.5 million people (2006; time of the project proposal) to approx. 2.2 million people (2017; more recent data not available).

No evidence could be found that the socio-economic study prepared by an international consulting firm in 2008 was taken into account in the selection of the individual measures. The poverty situation of customers was also not one of the selection criteria. The project activities in the respective areas were selected primarily on the basis of technical and economic criteria (which is in line with the separate agreements to the financing agreement). There is no indication of whether poor customers or refugees have benefited from the programme. It is also difficult to demonstrate whether the socio-economic situation of the population in the three governorates has improved, as no current poverty data are available and the last official statistical data were collected in 2008. It is still no longer possible to determine whether the socio-economic situation of the particularly poor people and refugees in the three governorates has improved – however, the programme was also not directly aimed at improving the socio-economic situation of the beneficiaries.

The results of the pilot zone set up in Zarqa showed that FC-indexed rehabilitation measures were able to reduce unaccounted for water, which could be reliably measured in a strictly defined area by up to 32% with the help of the DMAs. In terms of broad impact, however, this is rated as moderately successful. A pilot zone is normally set up to demonstrate that the measures will produce some results. The idea is to replicate this pilot zone. Furthermore, it is not set up with the aim of one-off reduction of losses, but the unaccounted for water should also continue to be tracked in order to implement further measures if necessary (sustainability). In the case of the pilot zone set up as part of the project, there was little interest in the supervision of the pilot zone by WAJ/Miyahuna following the withdrawal of the consultant. Due to a malfunction of the SIM cards used for data collection by the bulk water meters, ultimately this was no longer actively monitored. This means that the pilot zone for water loss detection and reduction in Zarqa cannot be regarded as broadly effective/exemplary. At the same time, the pilot zone in Zarqa formed the conceptual basis for the isolation and sectorisation of further water networks in Zarqa as part of further projects, in particular MCC and FARA. Specifically, new bulk water meters were installed as part of the MMC project to optimise the water supply in the pilot zone, but these made the water meters financed as part of the FC project redundant. Although the pilot zone was not further monitored by WAJ/Miyahuna and without an implementation consultant, the isolation of the pilot zone remained in place. Against this background, the pilot zone made an important conceptual contribution and thus also a certain broad impact, albeit differently than originally thought.

Overall, it can be assumed that the project's contribution to the efficient and sustainable management of the country's scarce water resources was limited due to the comparatively low investment volume or FC contribution and thus had a fundamentally positive but only minor effect at impact level. However, it is important to see the local measures in connection with all other FC-financed water loss reduction measures in the central governorates, as the joint FC contribution is rated significantly higher here.

Contribution to (unintended) overarching developmental changes

According to the current state of knowledge, no overarching, unintended developmental changes can be identified.

Summary of the rating:

Although it can be assumed that the project generally made a positive overarching political contribution (no-regret measures), we rate the overarching developmental contribution (impact level) as low. The assumption of the project was that a reduction in the NRW would lead to an improved drinking water supply, and therefore would contribute to the efficient and sustainable management of water resources, which was not achieved. It can be assumed that the project's contribution to efficiently and sustainably managing the country's scarce water resources was limited, as the investment costs were comparatively low and it was not possible to decrease unaccounted for water according to the available data. Therefore, it cannot be assumed that water resources will be managed efficiently and sustainably. At the same time, it is difficult to make an identifiable, overarching developmental contribution with such a low investment volume, especially since numerous external factors led to the deterioration of the sustainable management of Jordanian water resources. We therefore rate the overarching developmental contribution as moderately unsuccessful.

Impact: Moderately unsuccessful (4)

Sustainability

Capacities of participants and stakeholders

Although the flow meters installed in *Zarqa* as part of the project were indeed installed, they are no longer used because the *pilot zone* set up as part of the project has been changed in the meantime. At the instruction of WAJ, the water supply of the pilot zone was optimised – specifically: restricted to one supply line – for which a new bulk water meter was installed as part of the MCC project. As a result, the flow meters financed as part of the project were redundant or are no longer being used, meaning that the pilot zone originally set up as part of the project is no longer available. Against this background, it was not possible to assess any of the flow meters procured and installed in Zarqa as part of the FC project, as more than 10 years have passed since the measures were completed and the majority of the equipment has been replaced. However, the examined flow meters (not financed under the project) in the former pilot zone in Zarqa were of good quality and functional; the bulk water meter installed under the MMC project was of average quality. At the same time, Miyahuna criticised the fact that since the consultants had withdrawn as part of the MCC project, the new bulk water meter was not read either manually or digitally (which was also noted in the final inspection report for the WMG project flow meters still in use at the time). The main reason for this is substantial staff shortages at Miyahuna. Specifically, this is based on the example of Miyahuna Zarqa: according to the staff, out of a total of 485 employees, only 5 are employed in the NRW department and are responsible for the operation and maintenance of the NRW infrastructure throughout the entire governorate (currently around 1.3 million inhabitants).

In Balqa, several project sites were visited together with local Miyahuna representatives. At *Ain Hazeer* source, a bulk water meter was financed as part of the WMG project, but according to the staff, it has not been operational for nine years. However, the water pumped from the source to the Al Shariyeh water treatment plant (financed by USAID) is measured with a bulk water meter in the water treatment plant. In addition, a manhole cover from the drainage system was stolen, which has since only been temporarily covered. According to Miyahuna, theft of manhole covers seems to be a general problem. The pump station rehabilitated as part of the project near the *Ain-Azraq source* is still in operation, but the equipment of the entire station seemed outdated and in need of renewal. In addition, two of the five pumps were not functional. Of the two bulk water meters visited at the *Safout Reservoir*, which were financed with the residual funds from WMG as part of the FC project "Water loss reduction, central governorates", one was defective and the other was functional and in good condition. According to

Miyahuna, the switch from manual to digital meter reading is planned for the near future. WAJ/Miyahuna personnel seem (in the meantime) fundamentally able and willing to use digital reading for bulk water meters, which are currently manually read by lifting heavy manhole covers. However, the difficulties with the payment of SIM cards by WAJ mentioned in the final inspection report would have to be solved for this purpose.

Overall, Miyahuna's personnel were available at the sites visited and generally seemed able to operate the infrastructure at a fundamental level. However, the lack of staff and the lack of financial resources impair the proper operation and maintenance of the plants and the network. This became clear at almost all sites visited and also affects the measures financed under the project. Donor financing and support from consultants remain essential to ensure a sufficient water supply and maintain water infrastructure. At the same time, Miyahuna's assumption of operational management in the central governorates appears to have led to more professional operation and maintenance, even though Miyahuna is still unable to cover operating costs due to low tariffs and is dependent on state subsidies (and this is expected to remain so in the coming years).

Contribution to supporting sustainable capacities

During the site visits, employees were available at the sites visited and generally seemed able to operate the infrastructure at a basic level. However, the lack of staff and financial resources influence the proper operation and maintenance of the facilities and network. Donor financing and support still seems essential to enable a sufficient water supply and to maintain water infrastructure.

The FC project was made up exclusively of construction measures. Complementary measures to support the operator were not planned within the scope of the programme, these were to happen under the TC component instead. In this respect, the programme could not be expected to exert a significant influence on the sustainability of the executing agency's structures either.

In some districts in Greater Amman, the involvement of private companies is being tested through USAID in the framework of so-called "Performance Based Contracts" for the reduction of unaccounted for water and compliance with reduced rates in certain distribution areas. Even though final results were not yet available at the time of the mission, according to USAID, approaches appear to be proving successful in which Miyahuna autonomously decides in which distribution areas private companies take over the aforementioned tasks. The results of these approaches should be closely followed up and, if the assessment is positive, may also be applicable to the central governorates.

Durability of impacts over time

In principle, there is an increased risk that the water and wastewater infrastructure will no longer be sustainably operated and maintained if subsidies are reduced or not made available on time. At the same time, the interest and commitment of international donors in the Jordanian water sector remains high and various new approaches to improving the sustainability of investments in the water sector are being trialled (see MCC, FARA, USAID above). In addition, the key challenges faced by all contacts on the Jordanian side were clear and there was a willingness to improve, at least providing a basis for improving proper operation and maintenance.

Summary of the rating:

Overall, we rate the sustainability as unsatisfactory. Personnel were available at the sites visited and generally seemed able to operate the infrastructure at a fundamental level. However, the lack of staff and the lack of financial resources impair the proper operation and maintenance of the plants and the network. This became clear at almost all of the sites visited. Donor financing and support from consultants remain essential to ensure a sufficient water supply and maintain the water infrastructure. At the same time, Miyahuna's assumption of operations management in the central governorates seems to have contributed to the professionalisation of operations and maintenance, even though Miyahuna continues to be unable to cover operating costs, mainly due to low tariffs and high water losses.

Sustainability: Moderately unsuccessful (4)

Overall rating: 4

As a result, the KfW delegation, taking into account all available information, has the impression that the project was moderately unsuccessful. The project is still highly relevant and was implemented in close cooperation with TC, but the proper operation and maintenance of the implemented measures is insufficient due to a lack of financial resources and operating staff in WAJ and Miyahuna. In addition, the majority of the project objectives – which were clearly too ambitiously defined and based on a lack of data – could not be achieved. As a result, and against the backdrop of the low (and relatively broadly diversified) project funds, it was not possible to make any identifiable contribution to development policy.

Contributions to the 2030 Agenda

The objectives of the programme are 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. The project aims to achieve efficient and sustainable management of scarce water resources and thus contributes to achieving MDG 7 (Resource conservation) and the SDGs in Jordan, in particular to improving water quality and the efficiency of water consumption (SDG 6) and to climate change adaptation (SDG 13). It is also in line with the development policy priorities of the German Federal Government and the partner country. The project supports the Jordanian water strategy 2016–2025 and the sectoral objectives set out in the Jordanian Water Action Plan, which are also included in the water priority area strategy paper, which runs until 2010.

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

The project had the following strengths and weaknesses in particular:

- Still highly relevant for the project/the issue of water loss reduction
- Good interlinking between FC and TC as part of the cooperation project
- Socio-economic baseline survey fundamentally meaningful and welcome
- Design at the time makes sense; today, a holistic approach should be applied that incorporates the isolation of certain zones into smaller, district-measured areas (DMA) to localise unaccounted for water and apply specific measures.
- The small (and relatively broadly diversified) investment volume means that impacts at outcome and impact level are barely noticeable
- Sustainability or regularity of operation and maintenance inadequate/lack of operating personnel and financial resources
- Without donor-financed projects, long-term successful projects are difficult to conceive; a major challenge: how to establish sustainable operating structures that function without international consultants and donor support?

Conclusions and lessons learned:

- We recommend continuing with a holistic, more structured approach within the framework of the above-mentioned DMAs. Administrative and commercial processes would also have to be included, as well as the regular operation and maintenance of infrastructure to keep unaccounted for water at a lower level. Alternatively, the frequency of repairs in the water network can be an indicator of the condition of the network and provide an indication for NRW.
- The approach of using project funds where the need for water loss reduction is greatest makes sense in principle. If only small project funds are available, however, project measures should be focused (e.g. in one governorate) rather than widely spread in order to avoid “dilution” of the project impacts.
- In principle, after the talks with WAJ and Miyahuna, there seems to be awareness of the importance of water loss reduction. However, it might make sense to raise awareness of the importance and interest in an

adequate data basis (reading meters correctly, checking and writing down data basis regularly, etc., comparing data) among WAJ and Miyahuna employees through training courses, for example, which is a prerequisite for a correct water inventory in the corresponding district.

- In order to make tenders more attractive to local companies, tenders should be issued for smaller construction lots that correspond to the capacities of local companies. At the same time, it must be ensured that the number of construction lots remains manageable within the scope of a project.

Evaluation approach and methods

Methodology of the ex post evaluation

The ex-post evaluation applied 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:
Internal project documents (project proposal, Separate Agreement, final inspection, available executing agency and sector analyses, consulting reports, other), secondary specialist literature, strategy papers, context, country and sector analyses, impact evaluations, comparable evaluations.

Data sources and analysis tools:
Data collection on site/on-site visit to selected locations (in the governorates of Zarqa and Balqa), incl. photo documentation, (semi-structured) interviews

Interview partners:
Water Authority of Jordan (WAJ), Miyahuna employees at Zarqa and Balqa, Dorsch Consultant, GIZ (TC/FC cooperation project contract manager), German embassy/WZ consultant, USAID, random survey of several households/target group (total of 4)

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

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

The following aspects limit the evaluation:
In principle, it is challenging to evaluate a project in which the key measures were already completed and inspected 8 – 10 years ago. On the one hand, direct impacts of the financed measures are difficult to verify now, as numerous other interventions (both from other donors and from the executing agency's own funds) have taken place in the project area since the measures were completed. On the other hand, in the case of WMG, WAJ was the project-executing agency until the project was completed, but since the measures were completed, the operational management has been gradually taken over by Miyahuna. Representatives of the WAJ were therefore unable to name any personnel who had supported the implementation of the project and were still working at the WAJ. In addition, the representatives of the WAJ were not familiar with the details of the project, as there appears to be no adequate knowledge management/storage or a deficient transfer of project information at WAJ level. Project-specific locations and measures could only be identified with the active support of the implementation consultant and an older, former WAJ employee (now at Miyahuna). This appears to be a fundamental institutional or governance problem at WAJ level. At the same time, it is suggested that the FC Evaluation Department reconsider the sampling system, e.g. that in the case of several final inspections, a project in which the majority of the funds have already been implemented is included in the population of projects to be evaluated upon completion of the first final inspection report (and not only after implementation of all remaining funds in the context of other projects), in order to keep the period between completion of the main measures and ex post evaluation as short as possible (and only as long as necessary).

Methods used to evaluate project success

To evaluate the project according to OECD-DAC criteria, a six-step scale is used. 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:

Target system and indicators annex

Risk analysis annex

Project measures and results annex

Recommendations for operation annex

Evaluation questions in line with OECD DAC criteria/ex post evaluation matrix annex

Target system and indicators annex

Project objective at outcome level	Rating of appropriateness (former and current view)
During project appraisal: Improving the supply of clean drinking water and hygienic wastewater disposal to the population in the central governorates (Balqa, Zarqa and Madaba).	The project objective at outcome level is appropriate for a project to reduce water loss / increase efficiency. However, no measures for waste water disposal were financed as part of the project, which is why this should be removed from the module objective. The module proposal states: "More comprehensive measures in the area of wastewater are not to be classified as a priority in Phase I (EUR 5.3 million), but are planned for *Phase II."* In another section, it is stated that: "Phase II of the FC component of the "Water Management for the Central Governorates Cooperative Programme" will generally only be carried out once the future operating structures in the region are clear, and sustainable operation of the investments is ensured." Phase II is not yet known; for clearer separation, wastewater disposal should be deleted from the module objective. *Indicator 1* is generally appropriate, but the data must be viewed critically, as, to some extent, the measurement systems are too incomplete to ensure a sound data situation on unaccounted for water at network level (e.g. due to meter failures). As an alternative, statistics on the frequency of repairs and/or complaints (increase/decrease) could be applied. *Indicator 2* is appropriate. The assumption is correct that the improvement in operating cost coverage is a direct result of lower unaccounted for water / fulfilment of indicator 1. However, there are various factors that have a significant impact on the coverage of operating costs that were only addressed to a limited extent as part of the FC project, e.g. reduction of energy and personnel costs (e.g. through energy-efficient pumps). In addition, there are costs for the water from the Disi aquifer and additional burdens from supplying Syrian refugees. Assessment of *indicator 3* is currently difficult, as the socio-economic studies are not (yet) available. In addition, the indicator was assessed during the final inspection, but not agreed with the project-executing agency in the Separate Agreement. According to current data from the project completion report the last results of the customer satisfaction study are from 2009; however, the project was implemented by 2014. It can therefore be assumed that the results (increased water volume & customer satisfaction) are not attributable to the project measures. Basically, the approach of collecting data via surveys on customer

	satisfaction and service quality makes sense and is quite innovative (from the perspective at the time and today) for water loss reduction projects / increased efficiency, especially in view of the sometimes unreliable data situation of unaccounted for water at network level (also applies to other partner countries). At the same time, the results depend on the survey methodology and the size of the sample. Not currently to be evaluated independently as part of the EPE, as the survey/results are not available and the evaluation is mainly based on the available information from the project completion report. In the MP, it was already mentioned that, compared to other projects in the sector, the target indicators are set low, as only selective measures are implemented with the relatively low commitment amount, meaning that their impact on the overall sector can inevitably only be low.

During EPE (if target modified): improving the supply of clean drinking water to the population in the central governorates (Balqa, Zarqa and Madaba).

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 (2006)**	**Status at final inspection (2014)**	**Optional: EPE status (year)**
Indicator 1 (PA)	Reduce technical and administrative unaccounted for water by 5 percentage points by 2010	- 5%	Balqa 51% Zarqa 51% Madaba 41%	Balqa 62% (+11) Zarqa 59% (+8) Madaba 62% (+21)	Balqa 62.5% (+11.5) Zarqa 53.5% (+2.5) Madaba 42.4% (+1.4)
Indicator 2 (PA)	Increase in operating cost coverage by at least 10 percentage points by 2010	+10 percentage points	Balqa 63% Zarqa 73% Madaba 66%	Balqa 49% (-14) Zarqa 70% (-3) Madaba 45 (-21)	Balqa 76.7% (+13.7) Zarqa 81% (+8) Madaba 70% (+4)
NEW: Indicator 3	Improvement of the reliability of the drinking water supply and service quality as a result of customer surveys at the start and end of the project by the consultant of the OMS project or the baseline survey that will soon begin*	n/a	Results from customer satisfaction study 04/2008: 1) Satisfied with water volume: 49%	Results from customer satisfaction study 04/2009: 1)	According to current data from the project completion report the last results of the customer satisfaction

	* No targets were set for this indicator at the start of the project. As part of the project, three customer satisfaction studies were carried out, which were to provide information about the changes every six months. Satisfaction with the quantity of water rose on average from 49% to 78%. No reasons are given for this. In most of the locations surveyed, complaints about water quality decreased; in Zarqa and Salt they increased. Satisfaction with the service quality of the WAJ service centres fell in Fuheis, Dhiban, Madaba. It increased in Salt, Roussiefa and Zarqa. It should be noted that only a very small sample was surveyed within very short intervals. It is unlikely that the effects of the project were recorded in such a short time.		2) Satisfaction with WAJ service:	Satisfied with water volume: 78% (satisfaction with the quantity of water rose on average from 49% to 78%) 2) Satisfaction with WAJ service: Complaints about the service quality of the WAJ service centres fell in Fuheis, Dhiban, Madaba. They increased in Salt, Roussiefa and Zarqa.	study are from 2009; however, the project was implemented by 2014. It can therefore be assumed that the results (increased water volume & customer satisfaction) are not attributable to the project measures.

Project objective at impact level	Rating of appropriateness (former and current view)
During project appraisal: Contribute to economically efficient and environmentally sustainable water resource management	The reduction of physical and administrative unaccounted for water leads in particular to improved water supply in terms of quantity and quality, and to an improvement in the financial situation of the water supplier. It is assumed that water savings will be achieved by reducing unaccounted for water and thus conserving water resources. The overarching development objective is therefore deemed to have been achieved when the project objectives are achieved. The formulation of indicators for the impact level was therefore omitted because the achievement of the objectives at outcome level leads to the achievement of the impact objective. From the perspective at the time and today, the procedure seems appropriate. From a design perspective, the added value of separate, overarching indicators at impact level appears to be low, as the contribution via fulfilment of the outcome indicators is to be regarded as achieved. From the point of view of the reliability of separate data at impact level, it should also be noted that the data collection for water loss reduction is already not fully reliable at outcome level in some cases, as the measurement systems for measuring unaccounted for water at network level (indicator 1) via the WUs are often inadequate. It would have been possible to introduce another indicator at impact level, e.g. improvement in the health situation through improved water supply. In this case, however, it is not absolutely necessary.
During EPE (if target modified):	N/A

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)	N/A	N/A	N/A	N/A	N/A

Risk analysis annex

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

Ex-ante expected risks

Risk	Relevant OECD-DAC criterion
Personnel situation (number and qualification of employees) water administrations and WAJ not sufficient	Sustainability
Delays caused by changes in roles and responsibilities due to commercialisation and Decentralisation that impacts job profiles and work processes and causes delays.	Effectiveness/efficiency
WAJ head office does not delegate sufficient responsibility for project implementation to the local WAJ administrations in the central governorates.	Effectiveness
The deterioration in the operating cost recovery ratio to be expected due to the commissioning of major projects and the Jordanian government's unwillingness to adjust tariffs.	Sustainability

Risks that occurred during the course of the project:

Risk	Relevant OECD-DAC criterion
Risk of delay in competitive bidding and awarding of contracts (initially low interest of local companies due to lots that were too large).	Effectiveness/efficiency
The risk to the improper operation of the facilities (identified in the context of the final inspection at nearly all sites visited).	Sustainability
Risk of delay in decentralisation and commercialisation processes between operators due to their lack of autonomy and dependence on WAJ, accompanied by the risk of a deterioration in the operating cost recovery ratio due to the government's lack of willingness to adjust tariffs.	Coherence/sustainability

Ex post identified risks:

Risk	Relevant OECD-DAC criterion
Unreliable data or incorrect water inventory, which makes it almost impossible to adequately measure unaccounted for water (before and after)	Effectiveness/efficiency
The supply of water from the Disi aquifer since 2012 has increased water availability, but also the pressure in the water network in all three governorates, which has a negative impact on the load and NRW of the water network.	Effectiveness/efficiency
Illegal water theft	Effectiveness/efficiency
Undetected unaccounted for water due to unmapped old pipes that are not completely separated from the water network.	Effectiveness/efficiency
Rising energy costs, which have a substantial effect on the cost recovery ratio.	Effectiveness/efficiency/sustainability
Risk of delay in decentralisation and commercialisation processes between operators due to their lack of autonomy and	Coherence/sustainability

dependence on WAJ, accompanied by the risk of a deterioration in the operating cost recovery ratio due to the government's lack of willingness to adjust tariffs. However, progress has been made in decentralisation (Miyahuna is now responsible for operations in all three central governorates).	
Increase in water demand due to population growth, accelerated by refugees, especially from Iraq and Syria, which is exerting steadily increasing pressure on the water sector in general and on water utilities	Effectiveness/efficiency
Risk of improper operation and maintenance of facilities and the network due to lack of staff and financial resources.	Sustainability

Project measures and their results annex

During project implementation, areas were identified in the three central governorates in which unaccounted for water and reported leaks were particularly high. On this basis, packages of measures were developed that aimed to reduce technical and administrative unaccounted for water. The open-ended programme approach allowed the individual measures to be determined during implementation in accordance with WAJ priorities in consultation with KfW and the consultant. The following construction contracts were financed with the project funds:

Vertrags-ID	Beschreibung	Finanzierung
BMZ-Nr. 2006 66 263		
Vertrag I/1	Supply/Inst. Meters, Data Acquisition, Isolation Valves for Zarqa Pilot Area	WLR Middle Govern.
Vertrag I/2	Civil Works for Installation of Water Meters for Zarqa Pilot Area	WLR Middle Govern.
Vertrag II/3	Procurement of Pipes, Fittings and Appurtenance for Zarqa Pilot Area	WLR Middle Govern.
Vertrag II/4	Bulk Meters for Zarqa, Balqa and Madaba	WLR Middle Govern.
Vertrag II/5	Mobile Repair Units, Customer Management, Tools Zarqa, Balqa and Madaba	WLR Middle Govern.
Vertrag II/6	Civil Works for Zarqa Pilot Area	WLR Middle Govern.
Vertrag II/7	Sewer Bucket Machine for Zarqa	WLR Middle Govern.
Vertrag III/8	Well Rehabilitation, Spring Protection and PS, Balqa	WLR Middle Govern.
Vertrag IV/9	Meters, Pipes, Fittings, Safety Equipment for Balqa and Madaba	WLR Middle Govern.
	Consultant	WLR Middle Govern.

The following locations/measures were inspected as part of Final Inspection I (2014):

- spring capture in Ain-Azraq (Balqa)
- bulk water meter for measuring the amount of water exported from Al Fuhais at the export border to Miyahuna (Balqa)
- WAJ (Water Authority of Jordan) storage facility in Al Fuhais (Balqa)

- WAJ administration in Zarqa
- flow measurement devices in the pilot zone in Zarqa
- testing of two bulk water meters in Zarqa.

As part of the EPE, the locations/measures of Final Inspection I (2014) were assessed, with the exception of the bulk water meter in Al Fuhais, the specific location of which could not be localised either via WAJ, the consultant or Miyahuna, as well as the WAJ storage facility in Al Fuhais. However, a bulk water meter in Al Fuhais (not financed under the project) was inspected, and project measures at the Ain Hazeer well in Balqa were assessed. The (USAID-financed) drinking water treatment plant in Al Shariyeh was also inspected. In the pilot zone in Zarqa, it was also no longer possible to inspect the flow meters financed as part of the project, as these are now out of operation and have been replaced by other bulk water meters (as part of the MCC and FARA project). These newer meters in what was formerly the pilot zone were assessed.

For example, the residual funds of EUR 766,914.53 from the project for the partial financing of the component Ain Al-Basha & Safout (construction lot C2) were used as part of the project “Water loss reduction, central governorates” (WRMP I; BMZ no.: 2008 66 251) (final inspection 2019). The remaining funds for this component amounting to EUR 2.75 million were financed from the project “Water loss reduction, central governorates” (WRMP I; BMZ no.: 2008 66 251):

WAJ-Nr.		Beschreibung	Conractor	Vertrag	Finanz.	JOD/ EUR	KfW Anteil %	KfW-Anteil [EUR]			Stichprobe geprüft
								Juli 2019 Ausgez EUR	Reserv. EUR	Vorauss. Kosten EUR	R= Rechnung P=Physisch
2006 66 263 Water Management Fund Middle Governorates											
	WLR Middle Gov.	Ain Basha & Safout, C2	Masader Contracting	20/2013	Logas 12	JOD	100%	766.914,53	0,00	766.914,53	
		Teil-Summe						**766.914,53**	**0,00**	**766.914,53**	
2008 66 251 WRMP I											
	WLR Middle Gov.	Consulting	Dorsch		Logas 11	EUR	100%	1.773.445,36	0,00	1.773.445,36	
	WLR Middle Gov.	Ain Basha & Safout, C2	Masader Contracting	20/2013	Logas 27	JOD	100%	2.749.419,91	0,00	2.749.419,91	R, P
	WLR Middle Gov.	Mahiss, C3	Masader Contracting	21/2013	Logas 28	JOD	100%	1.470.365,52	0,00	1.470.365,52	R, P
		Teil-Summe						**5.993.230,79**	**0,00**	**5.993.230,79**	
2010 66 935 WRMP II											
	WLR Middle Gov.	Consulting	Dorsch		Logas 15	EUR	100%	269.302,42	0,00	269.302,42	
		Teil-Summe						**269.302,42**	**0,00**	**269.302,42**	
Vorhaben WVR Mittlere Gouvernorate											
		Gesamtsumme						**7.029.447,74**	**0,00**	**6.760.145,32**	**0**
Legende:		In der Regel wurden die Bauverträge in JOD abgeschlossen, die Consultingverträge in EUR. Die Kosten werden in der vorliegenden Tabelle nur in EUR dargestellt.									

Stand: August 2019

As part of Final Inspection II (2019), the sites at construction lots C2 and C3 were visited. As part of the EPE, measures within the framework of grid refurbishment in Ain Al-Basha and Safout (construction lot C2) were examined.
A summary of the results from the two final inspections and the EPE is presented below:

Measure	Status at Final Inspection I (2014)	Status at Final Inspection II (2019)	
Ain-Azraq well / pumping stations (Balqa)	Capacity increased, source protected against flooding. The remaining problem is diffuse contamination. During the inspection, it was not possible to observe whether the pumps were operated automatically or manually because the water was bypassed due to the quality defects.		Rehabilitated pump stations continue to be in operation; water is pumped to the drinking water treatment plant in Al Shariyeh (financed by USAID) using large amounts of energy (which was also inspected as part of the EPE; no defects identified), and is returned to Al Fuhais for the drinking water supply. This is necessary due to the continued pollution of the Ain-Azraq well. Equipment of the entire station outdated and in need of rehabilitation. In addition, two of the five pumps and the flow meters were not functional. The well was not accessible due to dense vegetation, so protective measures against flooding could not be assessed.
Protection of the Ain-Hazeer well in Balqa (Balqa)	-	-	At the well in Ain-Hazeer, the bulk water meter financed as part of the project was no longer functional and, according to the staff, has not been used for nine years. However, the water pumped from the well to the Al Shariyeh water treatment plant (financed by USAID) is measured with a bulk water meter in the water treatment plant. In addition, the steel cover for water drainage in the well in Ain-Hazeer was stolen and therefore a temporary cover was in use.
Rehabilitating the pipeline network and the		The quality of the work is rated as satisfactory/sufficient. The visible concrete elements appear to be heavily repaired and not “one-piece”. The pipes in the Safout Reservoir	Of the two bulk water meters visited at the Safout Reservoir, which were financed with the residual funds of the FC project “Water loss reduction, central

Safout Reservoir (construction lot C2)		appear to be of satisfactory quality. The bulk water meter installed in Ain Al-Basha from the Safout Reservoir to the distribution network was installed in the busy thoroughfare to the town centre. According to the consultant, the meter is designed to transmit data by SIM card, but it has been clear for several years that there is a general problem with the payment of SIM cards in WAJ's area of responsibility. There is no safe access to the measurement shaft to allow manual reading. During the final inspection, it was not possible to remove the lid and inspect the water meter. The cover of the pressure reducer in Ain Al-Basha appears to be very large and could hardly be moved during the final inspection. The operation and maintenance of the systems appear to be inadequate. The external elements (pipes and, above all, fittings that should be located in protected, closed shafts) appear to be more than two years old due to the effects of rust and dirt (commissioning took place two years ago). The system components are exposed to environmental influences due to missing covers. A slide valve shows a significant leak that has not been repaired. The flowmeters in the Safout Reservoir are powered by broken batteries. The bulk water meter installed in Ain Al-Basha is not read out. The fittings around the pressure-reducing valve in Ain Al-Basha were dirty and water was in the shaft. As it had not rained for weeks, it can be assumed that this is an unrepaired leak and not rainwater flowing into the sink.	governorates", one was defective and the other was functional and in good condition. According to Miyahuna, the switch from manual to digital meter reading is planned for the near future. Today, WAJ/Miyahuna staff seem to be able to use the digital reading for bulk water meters like the ones at Ain Al-Basha / Safout Reservoir, which are currently being read manually by lifting heavy manhole covers.

Pilot zone for water loss detection and reduction in Zarqa	The pilot zone is no longer monitored. The installed flow meters are no longer actively operated and are not read out either manually or digitally. Rehabilitation work with MCA financing is currently taking place in the pilot zone. As the installed flowmeters are no longer used, it cannot be assumed that they will provide verifiable data to monitor the success of the MCA-financed project. *Inspection of flowmeters with regard to the pilot area:* The three inspected flowmeters are intact and were able to provide data to document the water inventory in the pilot area. *Evaluation of random samples for the Zarqa bulk water meter:* As part of the project, several bulk water meters were purchased for the governorate of Zarqa, which are to be read out via a standalone computer in the WAJ administrative office in Zarqa. The records of two bulk water meters were checked on a random basis. Both evaluations give rise to the assumption of faults that have not yet been noticed. *Bulk water meter:* Has been equipped with a SIM card in order to centrally merge data digitally. The statistics serve as the basis for billing water volumes beyond the operator limits.	-	The pilot zone in Zarqa was not used or supervised by WAJ or Miyahuna, who took over operational management in 2015, after donor financing was discontinued / the consultant left. Miyahuna mentioned the lack of employees as the main reason why data was no longer read out. During the site visit in Zarqa, none of the procured and installed flowmeters (about 20% of the rehabilitated tertiary network in the pilot zone) could be visited, as more than 10 years have passed since the measures were completed, and most of the equipment was replaced (mainly as part of MCC and FARA projects). However, the examined flowmeters (not financed under the project) were of good quality and functional; the bulk water meter installed as part of the MMC project was of average quality. For the pilot zone, the consultant was able to measure a reduction in NRW from around 60% before the implementation of water loss reduction measures to around 40% after implementation of the measures in 2013.

	General criticism of the installed SIM cards: Often there is no reception at all on site, the flowmeter is installed underground in the road, there is even less reception there. Furthermore, the SIM cards are often not paid for to transfer data.		

Recommendations for operation annex

- For the operation of the rehabilitated spring capture, it was advisable to identify and contain the pollution origin of the well more precisely in order to also be able to obtain qualitatively sound drinking water in the long term. During the EPE, it was reported that the diffuse pollution probably results from waste water discharged from households. However, the pollution persists.
- As part of the project completion report, it was noted that some of the data obtained from the bulk water meters is recorded manually and used as a basis for billing, some of the data remain unused in the system. The intended completely digital recording, transmission and processing of the data was not carried out for any of the inspected water meters. According to the project completion report, it was to be expected that this behaviour would not change in the future without further measures, which was confirmed as part of the EPE. Correct data collection and processing is an essential basis for better water loss management and for billing water volumes but, at the sites inspected as part of the EPE, the data are still incomplete. Completely digital recording, transmission and processing of the data was also not performed as part of the EPE for any of the inspected water meters.
- As part of the project completion report, motivated and sufficiently qualified personnel were identified in WAJ's local administrations as one of the most important prerequisites for the successful operation of the financed measures. An improvement in the operating level was anticipated due to the conclusion of management contracts between WAJ and the public water utility Miyahuna for the governorates of Madaba (June 2013) and Zarqa (probably December 2014), as the previous operating level of Miyahuna in Amman is significantly more professional than that of the local WAJ units. These anticipated, fundamentally beneficial effects of the gradual transfer of water supply and waste water disposal in the central governorates of Madaba (2013), Zarqa (2015) and Balqa (2021) to the water utility Miyahuna were confirmed as part of the EPE. The already partially implemented commercialisation and decentralisation of the water sector is to be seen as an important sector policy step. However, further steps are necessary that guarantee Miyahuna, as a subsidiary of WAJ, further autonomy and economic independence and expand Miyahuna's financial and organisational scope for action, also in order to sustainably improve the operating level in the long-term.

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			2	o	
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?		MP, current sector policy documents, executing agency analysis			
Do the objectives of the programme take into account the relevant political and institutional framework conditions (e.g. legislation, administrative capacity, actual power structures)?	- Who is the main target of the measure, mainly the centrally organised WAJ or the decentralised operators (Miyahuna in the case of the central governorates)? How autonomous is Miyahuna? - What are the power structures / what is the situation with regard to the autonomy of local and regional operators, as well as the problem of water tariffs being too low?	Project completion report / MP, current executing agency analysis, interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Focus on needs and capacities of participants and stakeholders			2	o	
Are the programme objectives focused on the developmental needs and capacities of the target group?	Does the improvement to the quality of service and increased efficiency of local water administrations in the	Project completion report, Separate Agreement, consulting reports, interviews and discussions with project			

Was the core problem identified correctly?	central governorates of Balqa, Zarqa and Madaba continue to be an appropriate tool / priority area for improving the supply of clean drinking water to the population in the central governorates (Balqa, Zarqa and Madaba)?	participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
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?	The results of the socio-economic baseline survey, collected by GFA, have been available since 2008. Were these taken into account when selecting the measures?	Separate Agreement, socio-economic survey, interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Appropriateness of design			3	o	
Was the design of the programme appropriate and realistic (technically, organisationally and financially) and in principle suitable for contributing to solving the core problem?	Was WAJ/Miyahuna organisationally and technically able to implement the measures?	Consulting reports, interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Is the programme design sufficiently precise and plausible (transparency and verifiability of the target system and the underlying impact assumptions)?		MP, project completion report, interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Please describe the impact chain, incl. accompanying measures. Is this plausible?		MP, project completion report			

To what extent is the design of the programme based on a holistic approach to sustainable development (interplay of the social, environmental and economic dimensions of sustainability)?		MP, project completion report, socio-economic baseline survey			
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 DC programme was not yet in place when the measure was designed; but there was close integration with FC/TC cooperative programmes ("... complementary to the TC water programme component.")	MP, reporting			
Response to changes/adaptability			2	o	
Has the programme been adapted in the course of its implementation due to changed framework conditions (risks and potential)?		MP, project completion report, consulting reports			

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):			2	o	
To what extent is the programme designed in a complementary and collaborative manner within the German development cooperation	How was the division of labour with the TC/FC "central governorates" cooperative programme with the TC programme component "Operation and Management	MP, project completion report, reporting Interviews and discussions with project participants (KfW, GIZ, consultant)			

(e.g. integration into DC programme, country/sector strategy)?	Support in Water Supply and Sanitation in the Central Governorates (OMS)" carried out and implemented? How are the results of the TC component to be evaluated?				
Do the instruments of the German development cooperation dovetail in a conceptually meaningful way as part of the programme?	See above	MP, project completion report, reporting Interviews and discussions with project participants (KfW, GIZ, consultant)			
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.)?		MP, project completion report, reporting			
External coherence (complementarity and coordination with actors external to German DC):			2	o	
To what extent does the programme complement and support the partner's own efforts (subsidiarity principle)?	What efforts are being made by WAJ and Miyahuna to minimise unaccounted for water and improve the financial/economic situation?	MP, consulting reports Interviews and discussions with project participants (KfW, GIZ, consultant)			
Is the design of the programme and its implementation coordinated with the activities of other donors?		MP, reporting Interviews and discussions with project participants (KfW, USAID)			
Was the programme designed to use the existing systems and		MP, reporting			

structures (of partners/other donors/international organisations) for the implementation of its activities and to what extent are these used?		Interviews and discussions with project participants (KfW, USAID)
Are common systems (of partners/other donors/international organisations) used for monitoring/evaluation, learning and accountability?		MP, reporting Interviews and discussions with project participants (KfW, GIZ)

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			4	o	
Table of indicators: Comparison of actual/target	See main section				
Contribution to achieving objectives:			4	o	
To what extent were the outputs of the programme delivered as planned (or adapted to new developments)? (Learning/help question)		MP, project completion report, consulting report, reporting, UPMU monitoring report, Interviews and discussions with WAJ/Miyahuna Site visits			
Are the outputs provided and the capacities created used?		Project completion report, reporting, consulting reports Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			

		Site visits
To what extent is equal access to the provided output and created capacities (e.g. physical, non-discriminatory, financially affordable) guaranteed?	Have networks been repaired/replaced in poorer neighbourhoods? Was the poorer population also more satisfied? Were no poorer neighbourhoods disadvantaged in the selection of measures, and is the water price also affordable for socially weaker areas?	Project completion report Interviews and discussions with WAJ/Miyahuna and households Socio-economic baseline survey
To what extent did the programme contribute to achieving the objectives?		Project completion report, reporting, consulting reports WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Site visits
To what extent did the programme contribute to achieving the objectives at the level of the intended beneficiaries?	Customer satisfaction covered by indicator 3, last update usually part of the 2014 project completion report on the basis of the baseline survey; long-term impact of the measure can no longer be determined as part of the evaluation, as no further data is available.	Surveys of various households in Balqa and Zarqa about the general situation of the water supply WAJ/Miyahuna questionnaire
Did the programme contribute to the achievement of objectives at the level of the particularly disadvantaged or vulnerable groups involved and affected?	Were poor quarters/customers primarily taken into account for the selection of measures? Do refugees benefit from the measures?	Project completion report, reporting, consulting reports WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)

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)	Has the change of operator from the WAJ administrations to Miyahuna taken place in the service areas of the project? Was the operating level improved by this, as assumed in the project completion report?	Project completion report, reporting, consulting reports UPMU monitoring report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Which external factors were decisive for the achievement or non-achievement of the intended objective of the programme? (Learning/help question)	What is the situation today compared to the project completion report, in particular with regard to the energy costs and the costs for the Disi water? Why was Indicator 1 / WLR not achieved?	Project completion report, reporting, consulting reports UPMU monitoring report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Quality of implementation			3	o	
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?		Project completion report Questionnaire for executing agency Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Back-to-office reports			
How is the quality of the management, implementation and participation in the programme by the partners/sponsors evaluated?		Project completion report Questionnaire for executing agency Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Back-to-office reports			

Unintended consequences (positive or negative)			N/A	N/A	No evidence of a negative impact of the implemented project measures on the project objective could be identified during the mission.
Are unintended positive/negative direct effects (social, economic, environmental) identifiable (or foreseeable)?		Project completion report, reporting Questionnaire for executing agency Back-to-office reports			
What potential/risks arise from the positive/negative unintended effects and how should they be evaluated?		Project completion report, reporting Questionnaire for executing agency Back-to-office reports			
How did the programme respond to the potential/risks of the positive/negative unintended effects?		Project completion report, reporting Questionnaire for executing agency Back-to-office reports			

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			3	o	
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,		MP, project completion report, reporting			

sector, etc.)? For example, comparison of specific costs.					
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.)?		MP, project completion report, reporting Consulting reports			
Were the outputs produced on time and within the planned period?	What factors led to the delays in awarding contracts? Why were own funds not secured over a longer period of time? Are there already possible solutions for reducing delays in the future?	MP, project completion report, reporting Consulting reports Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna)			
Were the coordination and management costs reasonable (e.g. implementation consultant's cost component)?		Project completion report Consulting reports			
Allocation efficiency			2	o	
In what other ways and at what costs could the effects achieved (outcome/impact) have been attained? (Learning/help question)		Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Comparison with other FC projects			
To what extent could the effects achieved have been attained in a more cost-effective manner, compared with an alternatively designed programme?		Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Comparison with other FC projects			

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?		Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) Comparison with other FC projects

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 (- / o / +)	Reason for weighting
Overarching developmental changes (intended)			3	-	No reliable data basis
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)	How did groundwater extraction / water production (in m³/a) develop between 2006 and 2021 for the three governorates?	Official statistics WAJ/Miyahuna questionnaire			
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)	Has the socio-economic situation of the population in the three governorates improved?	No data available			
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)	Has the socio-economic situation of particularly poor people and refugees in the three governorates improved?	See above			

Contribution to overarching developmental changes (intended)			4	+	Direct area of influence of the project
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?		MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire			
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)		MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire			
Did the programme contribute to achieving its (possibly adjusted) developmental objectives at the level of the intended beneficiaries?	Has the socio-economic situation for the beneficiaries improved or have the project measures contributed to it? Also applies to the following three questions	MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire			
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?	See above + Contribution to impacts on particularly poor people/refugees	MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire			
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)	See above	MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire			
Which external factors were decisive for the achievement or non-achievement of the	See above	MP, project completion report, reporting			

intended developmental objectives of the programme? (Learning/help question)		Consulting reports WAJ/Miyahuna questionnaire			
Does the project have a broad-based impact? - 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)	Is the establishment of a pilot zone for water loss detection and reduction in Zarqa widely used / used as a model? If not, why not?	MP, project completion report, reporting Consulting reports WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			
How would the development have gone without the programme?		MP, project completion report, reporting Consulting reports			
Contribution to (unintended) overarching developmental changes			N/A	N/A	According to the current state of knowledge, no overarching, unintended developmental changes can be identified.
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)?		MP, project completion report, reporting Sector policy documents Consulting reports			
Did the programme noticeably or foreseeably contribute to unintended (positive and/or negative) overarching developmental impacts?		MP, project completion report, reporting Sector policy documents			

		Consulting reports
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)?		MP, project completion report, reporting Sector policy documents Consulting reports

Sustainability

Evaluation dimension Evaluation question	Specification of the question for the present project	Data source (or rationale if the question is not relevant/applicable)	Rating	Weighting (- / o / +)	Reason for weighting
Capacities of participants and stakeholders			4	o	
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)?	Are the necessary operating personnel available and do they have sufficient knowledge? Has the operating level improved since the WAJ transferred the service areas to the Miyahuna water utility company for the governorates of Madaba (October 2013) and Zarqa (January 2015)? How did WAJ/Miyahuna's workforce develop between 2006 and 2021? Comparison of project completion report operating level (2014 Section I, 2019 Section II) and the evaluation (2022)	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			

To what extent do the target group, executing agencies and partners demonstrate resilience to future risks that could jeopardise the impact of the programme?	What does the operator's partial autonomy look like after completion of the work? Does a lack of partial autonomy influence sustainability? With respect to dependence on subsidies: What would happen if the Jordanian state suddenly had to restrict its subsidy payments?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			
Contribution to supporting sustainable capacities:			4	o	
Did the programme contribute to the target group, executing agencies and partners being institutionally, personally and financially able and willing (ownership) to maintain the positive effects of the programme over time and, where necessary, to curb negative effects?	Are sufficient funds available for the operation and maintenance of the system as well as for smaller replacement purchases? How are leaks, illegal connections, water theft, etc. handled? Are losses searched for, or found only by chance? Are users aware of domestic losses? How has consumption developed?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			
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?	Are the required operating equipment, spare parts and tools for maintaining the water network available and are they regularly used for maintenance and repairs (if these were remitted as part of the project)?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			
Did the programme contribute to strengthening the resilience of particularly disadvantaged groups to		Project completion report WAJ/Miyahuna questionnaire			

risks that could jeopardise the effects of the programme?		Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit			
Durability of impacts over time			4	o	
How stable is the context of the programme (e.g. social justice, economic performance, political stability, environmental balance)? (Learning/help question)	Are the necessary subsidies also ensured for WAJ/Miyahuna in the future?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit Current executing agency analysis			
To what extent is the durability of the positive effects of the programme influenced by the context? (Learning/help question)	What effect did the influx of Syrian refugees have?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit Current executing agency analysis			
To what extent are the positive and, where applicable, the negative effects of the programme likely to be long-lasting?	Will the available water resources be sufficient to supply the rapidly growing population? Or to what extent would the efficiency of water distribution have to be improved in order to secure a sustainable supply?	Project completion report WAJ/Miyahuna questionnaire Interviews and discussions with project participants (KfW, GIZ, consultant, WAJ/Miyahuna) On-site visit Current executing agency analysis			