

Module proposal



DC Programme: Water Resources Management in Egypt
TC Module: Nile Delta Water Management Programme
Project number: 2019.2006.5

Presentation of a offer for the implementation of a TC module at the bid estimate price of up to EUR 8,500,000

This is a new TC module and parts of the German contribution are to be contracted out.

Nile Delta Water Management Programme in Egypt

Project number 2019.2006.5

Table of contents

List of abbreviations

1. Brief description	1
2. Classification of the project	2
2.1 Placement of the module in the programme	2
2.2 Other development measures in the specific intervention area of the module	4
3. Problem and potential analysis (related to the TC module)	6
4. Objectives, impact hypotheses, indicators and partners of the TC module	9
4.1 Goals, target groups, impact hypotheses and indicators	9
4.2 Sponsors and partner structure	11
5. Design of the TC module	13
5.1 Methodological approach (description of PPP, if applicable) and duration	13
5.2 Ensuring the sustainable effectiveness of the measures (outcomes)	18
5.3 Partner benefits, combined financing	19
5.4 Contract value and detailed cost estimate	19
6. Evaluation of the effects and risks of the module	19
6.1 Assessment of the effects	19
6.2 Assessment of the risks to the effectiveness of the module	21
6.3 Certificate	23
A Annex	
A1 Results matrix	

Nile Delta Water Management Programme in Egypt**Project number 2019.2006.5****List of abbreviations**

AC	<i>Affiliated Water and Wastewater Company</i>
AFD	<i>Agence Française de Développement</i> French Development Agency
E-DSS	<i>Energy Decision Support System</i> Digital decision-making system for energy-saving measures
FAO	<i>Food and Agriculture Organization of the United Nations</i>
EBRD	<i>European Bank for Reconstruction and Development</i>
EIB	<i>European Investment Bank</i>
FFS	<i>Farmer Field Schools</i>
HCWW	<i>Holding Company for Water and Wastewater</i>
IFAD	<i>International Fund for Agricultural Development</i>
MALR	<i>Ministry of Agriculture and Land Reclamation</i>
MoHUUC	<i>Ministry of Housing, Utilities and Urban Communities</i>
MWRI	<i>Ministry of Water Resources and Irrigation</i>
NUCA	<i>New Urban Communities Authority</i>
On-Farm PMU	<i>On-Farm Projects Management Unit</i>
SDC	<i>Swiss Agency for Development and Cooperation</i>
SECO	<i>State Secretariat for Economic Affairs (Switzerland)</i>
TSM	<i>Technical Sustainable Management</i>
USAID	<i>United States Agency for International Development</i>

1. Brief description

Module title	Nile Delta Water Management Programme
Sector	Drinking water, water management, wastewater/waste disposal
Programme	Water resource management
Programme objective / strategic reference	Through integrated water resource management with special attention to the effects of climate change and with the involvement of local civil society water security and efficiency is increased in a region of Egypt and the local and regional conflict potential is reduced.
Module Objective	Framework conditions for an efficient use of water in water supply and wastewater management as well as in irrigated agriculture in the Nile Delta are improved.
Contribution to the national implementation of the 2030 Agenda	Contribution to the Egyptian government's Vision 2030. Contributions to SDG 6 SDG 13, SDG 5, SDG 1 and indirectly SDG 16 and SDG 2.
Core problem	The relevant institutional actors at the various levels are only in a limited position to meet the challenges of a more efficient use and management of water resources that is adapted to the changes in the climate.
Target groups	Around 100 million inhabitants of Egypt; 1,900,000 smallholder farms in the governorates of Kafr El Sheikh, Beheira, Sharkia and Dakahlia. Intermediaries: Supply service providers in selected governorates, cooperatives and the agricultural extension.
Political sponsors	Ministry of Housing, Utilities and Urban Communities, Ministry of Agriculture and Land Reclamation
Methodological approach (incl. instruments)	<p>Management capacities of water and wastewater ACs for more efficient water use are strengthened and the advisory and service offer for smallholder farms in four governorates of the Nile Delta is improved.</p> <p>2 international long-term experts (LZFK), 10 national long-term experts (LZFK) (of which one 50%), national and international short-term experts (KZFK) as well as financing (up to EUR 150,000) and material and equipment (up to EUR 1,576,865) are used.</p>

Key outputs	1) management capacities of water and wastewater ACs; 2) Measures for efficient water use and climate-friendly operation of water and wastewater systems; 3) Advisory and service offer for smallholder farms; 4) Innovative measures and digital applications for efficient water use; 5) Participation of civil society and women groups
Cooperations	None
Order value	Up to EUR 8,500,000
Duration	07/2021 until 06/2024 (3 years)

2. Classification of the project

2.1 Placement of the module in the programme

The TC module Nile Delta Water Management Programme is part of the **DC programme** Water resource management in Egypt.

German development cooperation in the water sector pursues the goal of increasing water security and efficiency in a region of Egypt through integrated water resource management, taking special account of the impacts of climate change and involving local civil society. The TC module makes its contribution to the programme's objective in the sub-sectors of water supply and wastewater management and irrigated agriculture. The module focuses on improving the conditions for more efficient use of water resources in both subsectors. The impact hypothesis is that the further development and application of concepts such as climate-sensitive cultivation patterns, improved water demand planning, the reduction of technical and administrative water losses and the introduction of transparent processes in irrigated agriculture and water supply and wastewater management will contribute to efficient water use in both subsectors. This will ultimately increase water security and efficiency in a region of Egypt and reduce the potential for local and regional conflict.

The TC module **interacts** with the expiring FC module " Water Supply and Wastewater Management Sector Programme" (PN 2006.66.008) in the Nile Delta and with the FC module "Water Supply and Wastewater Programme Upper Egypt" (PN 2010.65.010), through which investments in the wastewater sector are being implemented in Kafr El Sheikh, Dakahlia, Gharbia and Fayoum. Direct links with the TC module are energy efficiency of plants, energy use of sewage sludge and reduction of water losses.

In addition, the TC module interacts with the FC multi-donor project "National Drainage Programme" (PN 2012.65.792), through which field drainages are renewed and irrigation infrastructure is modernised. Provided that a spatial overlap can be realised, direct cooperation can be realised in the area of building operational and maintenance skills in agricultural cooperatives and in the training of staff to operate pumps for field irrigation. Similarly, advising farmers on efficient water use can usefully complement investments in improved infrastructure.

In principle, the module contributes to the valorisation of FC investments already completed in the improved irrigation infrastructure in the Nile Delta.

<p>Programme objective: Through integrated water resource management with special attention to the effects of climate change and with the involvement of local civil society water security and efficiency is increased in a region of Egypt and the local and regional conflict potential is reduced</p>			
Indicators	Baseline value	Actual value	Target value
<p>Programme objective indicator 2: A contribution has been made to increase the agricultural productivity of smallholder farmers in TC intervention areas at the end of selected irrigation channels</p>	<p>0 %</p>	<p>Implementation of the previous TC project was suspended, therefore no increase in indicator value achieved yet.</p>	<p>Z+5 % (2023)</p>
<p>Programme objective indicator 4: Reduction of technical and administrative water losses in 6 governorates in the Nile Delta</p>	<p>The technical losses (water volume in cubic metres per month) and the administrative losses (collection) are on average 30 %</p>	<p>34 water loss reduction measures implemented in 5 governorates. Action plans to increase revenue from approx. 3,500 key accounts developed in 10 ACs.</p>	<p>Reduction of technical and administrative water losses (combined) by an average of 10%.</p>

2.2 Other development measures in the specific intervention area of the module

In the sub-sector of water supply and wastewater management, close cooperation with the TC module

"Egyptian-German Joint Committee on Renewable Energy, Energy Efficiency and Environmental Protection" (PN 2018.2131.3) in measures to increase energy efficiency in water utilities will take place in order to benefit from experience and ensure the coherence of the two projects (**outcome level**).

For example, development banks, such as the World Bank, are using digital decision-making systems for planning infrastructure projects that have been developed and implemented throughout the country with the support of the TC module "Water Supply and Wastewater Management in Egypt" (PN 2018.2157.8) and its predecessors. The systems, especially the digital decision-making system on energy saving measures and the database on water losses, are now being consolidated and rolled out across the board.

Furthermore, in addition to the existing quality management system *Technical Sustainable Management* (TSM), the controlling now to be implemented at management level at selected subsidiaries of the holding company for water and wastewater (*Affiliated Companies*, ACs) leads to a strengthening of all operational areas (**outcome level**).

Close cooperation is envisaged with the *United States Agency for International Development* (USAID) regarding the development of business plans and management capacities at the Holding Company *for Water and Wastewater* (HCWW) and the ACs (**outcome level**).

In the irrigated agriculture sub-sector, IFAD (*International Fund for Agricultural Development*), FAO (*Food and Agriculture Organization of the United Nations*) and the EU play an important role as donors. Here, TC assumes a leadership function with regard to personnel development of the agricultural extension to improve the range of extension services and the *scaling-up of the Farmer Field Schools* (FFS) (**outcome level**).

The TC module "Increasing the income of smallholder farmers (Agricultural Innovation Project)" (PN 2016.2250.5), which focuses on Upper Egypt, implements a value chain-based approach with a focus on smallholder farms. Synergies exist in economic considerations for sustainable resource use. Close exchange is also planned in the further development of the FFS instrument and cooperation with cooperatives (**outcome level**).

Synergies exist with selected FAO and IFAD projects in the areas of operation and maintenance of solar-powered irrigation infrastructure, FFS, digital extension services and mapping of cropping patterns to improve the module's approaches and apply them in other regions (**outcome level, impact level**).

Furthermore, both sub-sectors **work together** with the DC waste management programme with its TC module "National Solid Waste Management Programme" (PN 2018.2058.6) and the two FC modules (PN 2010.6659.6 and 2010.7022.5) in selected governorates of the Nile Delta. The waste modules reduce the extent of pollution of irrigation canals by municipal waste, which increases the availability of usable water. Further references exist in the cooperation in the areas of awareness raising as well as involvement of civil society (**impact level**).

No negative interactions are expected.

Doner	Project	Expected synergies at the impact levels
BMZ	Egyptian-German Committee for the Promotion of Renewable Energy, Energy Efficiency and Environmental Protection (PN 2018.2131.3)	Increasing energy efficiency in water utilities (outcome level).
AFD, EIB, EU, KfW, SECO	IWSP I and II	Bundling of German commitment (lead) and that of other donors in IWSP I and II (<i>Integrated Water and Sanitation Programme</i>); thus correspondingly higher impact of the programmes (impact level).
Multi-donor project (EBRD, EIB, EU)	<i>Kitchener Drain Depollution Project</i>	Complementing the measures financed by German DC in the areas of wastewater collection and treatment, water management in agriculture (drainage) and waste (Dakahlia, Gharbia, Kafr El Sheikh regions) (outcome level).
SDC	Drinking water management in Upper Egypt	Supplement of from the German DC financed measures in Upper Egypt (impact level).
USAID	Management of water supply and wastewater utilities	Strengthening management capacity in HCWW and selected ACs, including harmonisation of business plans (outcome level).
World Bank	Programme for sustainable sanitation services in rural areas, Phase 1	Complementing measures financed by German DC in the wastewater sector in the Nile Delta in Beheira, Dakahlia, Sharkia (impact level).
IFAD	Sustainable agricultural investments and livelihoods	Strengthening agricultural cooperatives, water user groups and agricultural extension services (outcome level).
FAO	Various initiatives on solar-powered irrigation, improving water productivity and remote sensing	Pilot solar-powered irrigation pumps in the Nile Delta, improve crop pattern maps, identify agricultural water use and productivity through remote sensing, strengthen FFS and digital counselling services (outcome level).
BMZ	Increasing the income of smallholder farmers	Synergies in the further development of mechanisms (FFS) and cooperation with cooperatives (outcome level).

BMZ	DC Programme Waste Management, TC Module "National Solid Waste Management Programme" and FC-Modules	Reducing the pollution of irrigation canals by municipal waste, increasing the availability of usable water, raising awareness and involving civil society (impact level).
-----	---	---

3. Problem and potential analysis (related to the TC module)

Baseline situation in the sectors: The Nile covers 85 % of the nationwide water demand for all areas of life for Egypt's approximately 100 million inhabitants. Climate change impacts and increased use of Nile water in the countries of the Nile's headwaters will lead to reduced water availability in Egypt in the future. Rising temperatures, longer and more intense periods of heat and drought, shifting climate zones as well as changes in water supply will make themselves felt.

The *Ministry of Water Resources and Irrigation* (MWRI) assumes that the Nile will only be able to cover 75 % of Egypt's future water demand in the medium and long term. Against the backdrop of the high annual growth rate of almost 2 %, the MWRI forecasts a decline in the amount of water available from the current 600 m³ per year per inhabitant to a level that is in the range of absolute water scarcity (less than 500m³ per year per person). This makes integrated and efficient management of available water resources a vital necessity for the country's survival. Water scarcity is a driving factor for fragility, conflict and violence in the national context.

95 % of households obtain their drinking water from a central water supply system, although water quality and supply security do not meet the required standards everywhere. From data analysed so far, it can be concluded that the technical and administrative water losses are between 40 and 50 % and not at the officially published 25 %. The efforts made some time ago by the *Ministry of Housing, Utilities and Urban Communities* (MoHUUC) to ensure cost-covering tariffs have not been continued recently. Nevertheless, the drinking water and wastewater utilities (*Affiliated Companies, ACs*) have been able to increase tariff collection and thus revenue to counteract the increase in operating costs. The increased energy costs have given the ACs an incentive to reduce their energy consumption. However, there is still a long way to go before the financial basis of the ACs is sustainably secured. Formally speaking, women are not disadvantaged in the Water Supply and Wastewater sector. The operational areas of the partner institutions have quite high quotas of women. There is a need to catch up especially in management positions.

Nationwide, only about 65 % of domestic wastewater receives adequate cleaning, as some of the wastewater treatment facilities are poorly operated. This leads to pronounced environmental and groundwater pollution. Fundamentally, the limited access to safe drinking water and sanitation (hygiene requirement) is detrimental to the health of the population, and here in particular to mothers, newborns and children.

Agriculture in Egypt's arid climate is almost exclusively dependent on irrigation. With an employment share of 20 %, agriculture still generates 11 % of the gross domestic product (GDP). Despite the low contribution to GDP and the relative scarcity of water, agriculture continues to receive over 75 % of the country's water resources for free. At the same time, water use efficiency in agriculture is only 50 %. The water quality in the canals is increasingly affected by the input of waste from settlement areas and the input of fertilisers and pesticides and insufficiently treated wastewater.

The modernisation of irrigation infrastructure and the establishment of structures for efficient and effective use and distribution of available water resources are progressing slowly despite intensive efforts. The government has launched a new programme to modernise irrigation infrastructure with a focus on the Nile Delta, but there is an urgent need for information and capacity development to implement the programme effectively.

While civil society groups are increasingly restricted in their ability to act, agricultural cooperatives are given more rights (e.g. through the Cooperatives Act). Cooperation and consultation between the Ministry of Agriculture and the Ministry of Irrigation still does not adequately cover the issues relevant to integrated management. Farmers and farmers' organisations are only involved in decision-making processes to a limited extent and do not always have the information they need to use irrigation water efficiently.

Women are still particularly disadvantaged in the agricultural sector. Women are underrepresented in farmers' organisations and have little access to credit or to agricultural production factors, especially land and water.

Derivation of the module objective: The institutional actors in the two subsectors are only in a limited position to meet the challenges of a more efficient use and management of water resources that is adapted to climate change. In both subsectors, the preconditions for the more efficient use of water resources, the development of new procedures and methods for dealing with climate change, the reduction of water losses and the implementation of transparent processes in drinking water supply and wastewater management are insufficiently developed (**core problem**). Therefore, the module objective is: The conditions for more efficient water use in water supply and wastewater management and irrigated agriculture in the Nile Delta are improved.

Causes and assessment of changeability: In water supply and wastewater management, there is a lack of knowledge in the different business areas (e.g. operational control, technical and commercial management) as well as experience of broad-based implementation and reduction of water losses in industrial areas. In particular, the potential of women is underutilised in ACs at senior management levels. The aforementioned causes can be changed.

To improve energy efficiency in pumping stations, water treatment and clarification as well as the energetic use of sewage sludge, a broadly effective application and evaluation of the processes is necessary. The ACs currently have neither efficient operational control with secured data nor operational plans for business management. The HWCC can only insufficiently fulfil its supervisory function because it lacks the data basis to compare the development of the operational indicators of the ACs. These causes can be changed.

The economical use of water resources at the household level is not yet sufficiently propagated. Campaigns to sensitise the population and motivate them to cooperate are only taking place in isolated cases. The causes mentioned can be changed.

Water users face the challenge of adapting to the modernisation of irrigation infrastructure, for example in the operation and maintenance of the new pumps. The above causes are partially changeable.

There is a lack of advisory services and technical support for smallholder farms on the efficient and climate-sensitive use of water. The state advisory service lacks staff as well as technical possibilities to disseminate advisory services in digital platforms, e.g. social media. Furthermore, the extension service does not always have sufficient and up-to-date information and recommendations for improving water management to pass on to smallholder farms. The above causes are partially changeable.

The recording of cropping patterns (crop rotation) of smallholder farms by the external structure of the Ministry of Agriculture and Land Reclamation (MALR) for forwarding to the responsible structures of the MWRI at the governorate and district level is insufficient for climate-sensitive water demand planning at the national level in the ministry. The above causes are partially changeable.

Women in rural communities have little access to agricultural production factors, especially water and land. They lack prospects for resource-efficient and sustainable income generation. The above causes are partially changeable. **Impacts achieved so far:** Digital decision-making systems for the design and planning of investment measures were introduced in a number of ACs. Increasing use of the certified quality management system TSM improved technical operation and maintenance of facilities. Efficiency gains and cost savings were made in all ACs and at HCWW, as important internal processes were systematically analysed and optimised. This improved transparency, corruption prevention (*Water Integrity*) and operating cost recovery of the ACs. As a result, the engagement of national and international organisations has increased significantly.

In 4 of the 25 districts in the governorates of Kafr El Sheikh and Beheira, the agricultural administration can access updated basic data on the allocation of cultivated areas to the higher-level irrigation system as well as regularly updated information on cultivation patterns.

The data forwarded to the MWRI's external structure is the basis for cultivation and water demand planning. This increases irrigation efficiency and prevents water losses.

The functional operation and maintenance of the improved irrigation infrastructure in selected districts avoids crop losses caused by irrigation pump failure and reduces water losses. This contributes to efficiency gains in food production.

With the dissemination of FFS, the training of 130 trainers, and with the anchoring of this instrument at the governorate level, the state extension service now has an efficient instrument for targeted advice and instruction of smallholder farms. 20 women's groups in 2 governorates have qualified in water-efficient measures and are applying them to improve their income.

4. Objectives, impact hypotheses, indicators and partners of the TC module

4.1 Objectives, target groups, impact hypotheses and indicators

Module objective: Framework conditions for an efficient use of water in water supply and wastewater management as well as in irrigated agriculture in the Nile Delta are improved.

Indicators:

1. Water loss information provided by the *Holding Company for Water and Wastewater* (HCWW) for the National Water Strategy is based on measured data from an estimated 100 districts.

Baseline value: 0 (data is not recorded in a structured manner)

Target value: Provided information on water losses is based on measured data from 100 districts (2022)

2. In 3 out of 25 ACs, the verification of the achievement of targets for efficient water use is based on the monitoring system of business plans.

Baseline value: 0 (monitoring system not yet established)

Target value: Review of target achievement based on the monitoring system in 3 out of 25 ACs (2023)

3. 1,000 out of estimated 2,000 smallholder farms have used the new services on the improvement of water efficiency offered by 18 agricultural cooperatives in 4 governorates.

Baseline value: 0 (cooperatives do not yet offer any new services)

Target value: 1,000 smallholder farms (2023)

4. 20,000 out of the 80,000 smallholder farms that have been advised in 4 governorates confirm with examples that they have applied the agricultural extension recommendations for more efficient water use.

Baseline value: 15,000 smallholder farms were advised, no confirmation of application

Target value: 20,000 smallholder farms confirm application (2024)

5. 160 women groups in 4 governorates have applied 1 of the 5 promoted water-efficient measures for the improvement of their income.

Baseline value: 20 women groups

Target value: 160 women groups (2024)

The target value of module target indicator 1 is provisional and will be reviewed in the first year of implementation and adjusted if necessary in the context of the first reporting.

For further details, see the graphical representation of the impact logic and the impact matrix in the appendix.

Regardless of the fundamental agreement between the content of the approaches of the TC module and national strategies, there are currently no indicators of a national strategy for the implementation of the 2030 Agenda to which reference could be made.

The **target groups** in water supply and wastewater management are Egypt's current population of around 100 million. Improved and more efficiently provided supply services basically benefit the part of the population supplied by the ACs (approx. 95% in the drinking water network). Poor population groups in particular benefit from the project. The implementation of concrete measures focuses on selected regions or ACs, but follows a nationwide approach.

The target groups in the irrigated agriculture sub-sector are the approximately 1.9 million smallholder farms in four governorates of the Nile Delta (Kafr El Sheikh, Beheira, Sharkia and Dakahlia). These are predominantly poor subsistence farmers who cultivate very small areas of land. Around 25 % of smallholder farms are run by women and 37 % of the labour force in the agricultural sector are women.

Impact hypotheses:

Output 1 aims to improve the management capacity of HCWWs and ACs. The HCWW is to be enabled to implement standardised operational plans and a quality-controlled monitoring system for the top management level at the ACs nationwide. The impact hypothesis is that this will enable the ACs to provide basic services to the target group more efficiently and with improved quality.

Output 2 aims to develop and scale innovative practices to improve the operational and energy efficiency of ACs. The impact hypothesis is that the reduction of water losses will lead to an increase in fee income as well as more efficient water use. The reduction of water losses and energy consumption also contributes to the financial stabilisation of the ACs. Furthermore, the HCWW will be enabled to determine a realistic value of water losses for all ACs and to formulate and track sector-wide targets to improve water use efficiency.

Output 3 aims to improve extension services for more efficient irrigation and adaptation to climate change. Furthermore, cooperatives representing local farmers are enabled to offer support and advisory services that are demanded by their members. The impact hypothesis is that smallholder farms will be enabled to improve water use efficiency at farm level through improved advisory services on water-saving cultivation practices and more efficient irrigation. Furthermore, it is postulated that cooperatives know the needs of their members best and, with the new services offered, strengthen smallholder farms in terms of efficient use of water resources for irrigation and effective maintenance of irrigation infrastructure.

Output 4 aims to strengthen the technical and organisational basis for climate-sensitive water demand planning and for the efficient operation and maintenance of the improved irrigation infrastructure. The impact hypothesis is that, on the one hand, the preconditions for climate-sensitive water demand planning on the part of the MWRI will be created on the basis of collected digital data in order to reduce water losses in irrigated agriculture. Furthermore, water will be used more efficiently at the level of smallholder farms through the training of smallholders in the efficient operation and maintenance of irrigation infrastructure.

Output 5 aims to strengthen the role of civil society organisations in raising awareness of water conservation at the household level, with a focus on women and youth. Furthermore, women groups at the community level are empowered to implement water-efficient agricultural measures to improve their income. The impact hypothesis is that the strengthening of civil society organisations in cooperation with ACs will have a broad impact in promoting water conservation at the household level and that women will be better able to cope with the challenges associated with resource scarcity through the implementation of water-efficient, income-generating measures.

The BMZ's strategic guidelines were taken into account.

4.2 Supporters and partner structure

The **policy executing agencies** are the Ministry for *Housing, Utilities and Urban Communities* for the water supply and wastewater management and the Ministry of Agriculture and Land *Reclamation* for the irrigated agriculture sub-sector.

With the award of the contract, the political executing agencies receive the right to demand the services to be provided to them directly from GIZ. The GIZ and the political executing agencies will regulate the details in separate implementation contracts. The BMZ may exercise its rights under the contract, in particular those under the general contract, without the consent of the political executing agencies.

Implementing partners: In water supply and wastewater management, the MoHUUC is responsible for national sector policy formulation and policy governance of utility services. However, it still does not have an institutionally anchored structure for this governance of the water sector. Tasks in this area are currently taken over by a project management unit in the ministry financed by the World Bank. Against this background, direct cooperation with the ministry is only possible to a very limited extent.

The implementing partners are the HCWW and its subordinate ACs. By law, the HCWW is responsible for the treatment, distribution and sale of drinking water as well as for the collection, purification and safe disposal or reuse of wastewater in the supply areas of its ACs. Its management staff is increasingly well trained and professional. In the HCWW there are almost 800 and in the ACs more than 130,000 employees are employed. Middle management still lacks experience in a wide range of areas. The 25 ACs have deficits in terms of operational and economic performance.

Implementing partners for the irrigated agriculture sub-sector are MALR's implementation units for extension services and for the agricultural service sector. Institutionally, MALR is responsible for the irrigation system at farm level and its direct supply channels. The agricultural services unit is responsible for supporting the agricultural cooperatives. The

agricultural extension sector is responsible for the development and dissemination of extension recommendations. Downstream from it are the Agricultural Extension Service Sub-Department and the Water and Soil Management Sub-Department.

The latter is responsible for consolidating water needs. Due to the long-standing recruitment freeze, the extension service in the governorates has fewer and fewer staff and insufficient resources to prepare and disseminate the knowledge necessary for farmers in suitable formats. At the governorate level, the agricultural extension and services are under the authority of the Under-Secretary of Agriculture.

Downstream partner structures: In the water supply and wastewater management sub-sector, the *New Urban Communities Authority* (NUCA) is responsible for new towns with the aim of reducing population density along the Nile. NUCA's tasks in the more than 40 towns include drinking water supply and wastewater management, including desalination plants, with the construction, maintenance and operation of the plants being carried out by private companies. The capacities of NUCA staff to monitor the companies are limited.

Another partner is the Association of Non-Governmental Organisations in the Water Sector with a total of 15 members. The association was established in 2020 by HCWW with the support of the predecessor project and has limited capacity in coordinating members and their water saving campaigns for households.

Downstream partners in irrigated agriculture are the Foreign Relations Department under the Ministry of Agriculture and the Project Management Unit for Irrigation Projects at field level (*On-Farm PMU*).

Due to its central role in the implementation of major donor programmes in the field of modernisation of the infrastructure in irrigated agriculture, this is an important partner for all issues related to infrastructure improvement. The agricultural research centre assigned to MALR has more than 100,000 scientists who develop new recommendations and make them available through decentralised research institutions in governorates. However, translating scientific findings into practically applicable recommendations is only insufficiently successful, also because the cooperation with the agricultural extension service is characterised more by competition than cooperation.

The umbrella organisations for cooperatives at governorate level, which are subordinate to MALR, as well as the cooperatives in the 48 agricultural districts in the four governorates and the more than 1,600 village cooperatives are made up of elected farmers' representatives and government employees together. After the adoption of the new law for the cooperatives, they now have more possibilities to act more autonomously and to orient their services more specifically to the demand of the members. However, this requires targeted training and the anchoring of new service offerings in the cooperatives' bylaws.

The MWRI is responsible for overarching irrigation water distribution issues at the main and sub-canal level, making it a key partner in improving demand-driven water distribution based on agricultural cropping patterns.

In addition to agricultural extension services, local women groups are potential partners for the implementation of women initiatives at community level, if mobilised appropriately. Local companies are potential partners in the provision of services provided by cooperatives, e.g. for the maintenance of irrigation infrastructure.

5. Design of the TC module

5.1 Methodological approach (description of PPP, if applicable) and duration

Duration: from 07/2021 to 06/2024 (3 years).

The **strategy for the water supply and wastewater management sub-sector** builds on the experience and impacts of the previous TC modules and focuses more on promoting top-level management at the ACs. In addition, the HCWW's supervisory function is expanded to include regular reviews of the ACs' achievement of objectives to enable early corrective action in the event of deviations from policy targets. The promotion of ACs focuses on efficient water use and climate-smart operation of facilities by scaling up proven water loss reduction measures, implementing the use of the digital decision-making system for identifying energy saving measures (E-DSS) across the country, and strengthening the capacity of ACs to implement the measures. The water loss reduction measures of the ACs will be combined with strengthening the capacities of civil society organisations to sensitise households to use water more sparingly. To increase transparency, existing standard processes will be consolidated and extended to other sensitive areas.

Gender equality is promoted both in the partner organisations - specific promotion of women in leadership positions - and at the target group level - by focusing awareness-raising on women and youth.

The **strategy for the irrigated agriculture sub-sector** builds on the experiences and impacts of the previous TC modules and is thematically oriented towards the reduction of water losses and the efficient use of water, taking climate change into account, in irrigated agriculture in the Nile Delta, with the area of intervention being expanded by two to four governorates. The interventions are strategically targeted at the farm level. At the governorate and district level, the capacity of the agricultural extension service will be strengthened to advise smallholder farmers on the use and application of improved irrigation infrastructure and new water-efficient farming practices, and to improve their digital extension services. Exemplary mechanisms for climate-sensitive water demand planning are being established in the districts. The capacities of selected cooperatives are strengthened to offer their member farms services for the operation and maintenance of improved irrigation infrastructure. At the local level, women groups are specifically supported in the application of water-efficient cultivation methods to increase household income.

Outputs

Output 1 aims at strengthening the management capacities at the ACs through the exemplary introduction of a monitoring system of key operational indicators, combined with an assurance of the quality of the data. For sustainability, this monitoring system for top management is to be closely linked to the new business plans to be drawn up. Experiences will be processed and used as a binding target for implementation through ACs via the HCWW. The development and implementation of gender-specific training programmes for managers from the ACs will ensure that needs of female professionals are better taken into account. Furthermore, an extension of standardised processes in ACs to warehouse management is envisaged to improve procurement, warehousing and transparency. In addition, capacities of NUCA staff on contract design and monitoring of contract performance

will be strengthened. **Milestones** are: Monitoring system for operations management is developed, gender specific leadership development programme is developed, guidelines for standardised stock management are developed.

Output 2 initiates measures for efficient water use and climate-friendly operation of water and wastewater systems. This includes the exemplary scaling of tested procedures for water loss reduction and increase of fee revenues in further municipalities and selected industrial areas. In addition, the already developed E-DSS and the experience gained in the energetic use of sewage sludge will be applied. This will enable the ACs to prepare annual energy efficiency plans. In support, the qualification and certification of energy managers will be continued. Measures to reduce water loss, increase fee collection, save energy in the water sector and recover energy from sewage sludge conserve scarce water resources, generate additional revenue in the utilities (ACs) and contribute to climate change adaptation. Existing data on actual water losses will be compiled to enable the HCWW to bring a realistic value on water losses into the national water strategy. Training modules on infrastructure maintenance and operation for technical staff of ACs and NUCAs will be extended to drinking water desalination plants to improve their operational efficiency. **Milestones** are: proven water loss reduction practices are prepared for scaling up, data for preparing annual energy efficiency plans are entered in the E-DSS, data on actual water losses are collected.

Output 3 aims to improve the services offered by the Agricultural Extension Service and cooperatives with regard to water-efficient farming practices. To achieve this, extension teams of the Agricultural Extension Service and the research institutions of the Ministry of Agriculture are advised and supported in the development of technical information (e.g. on climate resilience of varieties, seeds, water-saving cropping patterns, agricultural practices). This technical information is disseminated to farms through different information channels (FFS, digital extension services and cooperatives) using digital media such as Facebook and WhatsApp. Furthermore, cooperatives at community and district level are advised and provided with technical support in revising their bylaws and expanding their range of services for member farms (e.g. dissemination of agricultural extension service offers, management of repair centres, joint marketing of water-saving crops). Members of the board and experts from the cooperatives are accompanied in the development and introduction of the service offers for their smallholder member farms and qualified for their new fields of activity. **Milestones** are: Technical information has been prepared for dissemination, digital advisory formats have been developed, and concepts for new services offered by the cooperatives have been developed.

Output 4 aims to initiate innovative measures and digital applications for efficient water use by smallholder farms. To achieve this, the digital capacities of the extension centres and GIS departments at district level will be strengthened. Building on this, the district soil and water departments in Kafr El Sheikh and Beheira governorates will be qualified to collect and process data on current cropping patterns of smallholder farms and to produce geo-referenced digital maps. Appropriate exchange formats are being established for the transfer of these data for water demand planning to the MWRI field offices at the district level, in order to be able to provide the farms with the water resources required for optimal irrigation of the cultivated varieties. In consultation with the MWRI extension service, the farmers responsible for pump operation are being trained in the efficient operation and proper maintenance of the new irrigation infrastructure. Accompanying the qualification measures, demonstration areas with water-saving cultivation practices (e.g. drip and sprinkler systems, monitoring of salinity

in water and soil, solar-powered pumps) will be established. **Milestones** are: District soil and water departments are qualified to collect and process data, planning is in place to establish the demonstration areas.

Output 5 aims to strengthen processes for the participation of civil society and women groups in both sub-sectors in relation to efficient water use. In the water supply and wastewater management, a guide on the design and implementation of gender-sensitive water saving campaigns for its members is being developed together with the HCWW's civil society affairs department and the newly established Federation of Water Non-Governmental Organisations. This strengthens civil society groups and improves quality standards for awareness-raising activities, which will continue to be supported. In irrigated agriculture, women groups at community level are being trained in the use of water-efficient and income-generating measures (e.g. hydroponics, barley or mushroom cultivation on rice straw). To flank the qualification measures, demonstration facilities for the women groups are being equipped. **Milestones** are: Guidelines for water saving campaigns are available, women groups are qualified, demonstration facilities are equipped.

Outputs	Essential activities	Timeframe / Milestones
Output 1	Development of a monitoring system with the most important operational indicators of ACs. Implementation of a gender-specific leadership development programme for ACs. Develop guidelines for contract management including training for professionals in ACs and in the New Urban Communities Authority (NUCA). Development of standard warehouse management procedures, including Improvement of internal controls.	12/2022 Monitoring system developed for operational management 06/2023 Leadership development programme developed 12/2022 Guidelines developed for standardised warehouse management
Output 2	Scaling up approaches to reduce technical and administrative water losses in municipalities and industrial areas. Application of the digital system to identify energy saving measures in ACs, including certification of energy managers. Promoting the use of sewage sludge in selected ACs.	06/2023 Process for water loss reduction reprocessed 12/2022 Data for energy efficiency plans entered in E-DSS 06/2022 Data on actual water losses captured

	Development and implementation of training modules for operation and maintenance of desalination plants for drinking water (ACs and NUCA)	
Output 3	<p>Development of advisory modules on water-saving cultivation practices.</p> <p>Dissemination of extension messages to smallholder farmers through Farmer Field Schools and media campaigns.</p> <p>Development of bylaws and business models for cooperatives at district and Community level for services for smallholder farmers</p>	<p>06/2022 Technical information available</p> <p>12/2022 Digital counselling formats developed</p> <p>06/2023 Concepts for service offers by cooperatives are available</p>
Output 4	Improve the digital capacity of agricultural extension centres and GIS departments.	12/2022 Soil and Water Departments of the Districts qualified
Outputs	Essential activities	Timeframe / Milestones
	<p>Training of water user groups and cooperatives on operation and maintenance of improved irrigation infrastructure.</p> <p>Improvement and dissemination of digital maps including salinity in water and soil.</p> <p>Strengthen exchange formats on water demand planning between the Ministry of Agriculture and the Ministry of Water.</p> <p>Equipping demonstration areas with water-saving cultivation practices</p>	12/2022 Planning for the establishment of the demonstration areas is available
Output 5	<p>Conduct awareness-raising campaigns with a special focus on women, youth and children.</p> <p>Training of women's groups on income-generating water-saving measures incl. Demonstration facilities</p> <p>Measures to enable smallholder farmers to take advantage of the national Complaint management system</p>	<p>12/2022 Guide for water saving campaigns is available</p> <p>06/2023 Women groups qualified</p> <p>12/2023 Demonstration facilities equipped</p>

5.2 Ensuring the sustainable effectiveness of the measures (outcomes)

Ensuring sustainable effectiveness is anchored throughout the methodological approach (cf. Chapter 5.1). In the water supply and wastewater management sub-sector, advisory topics (new procedures, methods, concepts) are developed and tested in cooperation with experts and managers in selected ACs before they are disseminated for horizontal scaling-up via the HCWW (e.g. water loss reduction, energy efficiency). The implementation of tools developed with partners (e.g. monitoring system of operational indicators, business plans, guidelines for contract management) are accompanied by training measures. In addition, further training is offered for professionals in the sector (e.g. senior management positions, contract management, operational management of drinking water and wastewater treatment plants, desalination plants, implementation of gender-specific water saving campaigns). This sustainably anchors the knowledge and experience in the sector in national institutions.

In the irrigated agriculture sub-sector, the focus of sustainable effectiveness is on the cooperatives and the agricultural field offices at district and community level. By developing a financially sustainable business model, essential foundations are being laid for the cooperatives to establish their expanded range of services in the long term. Through the introduction of digital extension services, the agricultural extension service will be enabled to provide broad-based extension services to smallholder farmers, even with reduced staff. The consolidation of procedures for the production of the geo-referenced maps with information on the current cropping patterns of smallholder farms and the transfer of the maps to the MWRI field offices at district level will institutionalise a hitherto critical interface in water demand planning. The demonstration areas are established in districts prioritised by MALR for investment measures in improved irrigation infrastructure to ensure the long-term application of the capacities improved in the areas.

5.3 Partner services, combined financing

	Concretisation
Combined financing	-
Partner services	<p>Staff HCWW and ACs total 95 month; HCWW: Office space for GIZ staff and assumption of operating costs; Proportionate funding the participation of staff members participate in training courses in Egypt.</p> <p>Staff MALR (mostly at governorate level) total 80 month;</p> <p>MALR: Budget contributions for operational and administrative costs, e.g. office space for GIZ staff; costs for training measures; costs for the maintenance of new initiatives (e.g. premises, GIS units at governorate level).</p>

5.4 Contract value and detailed cost estimate

Up to EUR 8,500,000 (of which EUR 5,000,000 for water supply and wastewater management and EUR 3,500,000 for irrigated agriculture).

The contract value also includes costs for participation in the specialist networks "*Mediterranean Environmental Network*" and "*Services on Water and Sanitation*" (SOWAS) with the aim of ensuring the technical quality and knowledge management required for contract implementation.

The preparation of the project is also part of the contract. The preliminary costs of the measure are transferred to the project after commissioning or, if not commissioned, to the "Egypt Study and Skilled Workers Fund" (PN 2017.3504.2).

The preparation and evaluation of projects are carried out in accordance with the procedure agreed between BMZ and GIZ, which GIZ carries out on behalf of BMZ.

For a detailed cost overview, please refer to appendices 3a "Cost estimate and cash outflow by financial year" and 3b "Cost-output allocation".

6. Evaluation of the effects and the risks of the module

6.1 Evaluation of the effects

Impacts in general: The module contributes to the national Sustainable Development Strategy (Sustainable Development Strategy - *Egypt Vision 2030*) and to the achievement of the international Sustainable Development Goals (SDGs). Specifically, the measures directly contribute to the achievement of SDG 6, availability and sustainable management of water and sanitation (sub-goals 6.1 and 6.2, access to drinking water and sanitation for all; 6.5, integrated water resources management; 6.6, protection of ecosystems), SDG 13, action to combat climate change and its impacts (sub-goal 13.1, strengthening resilience to climate change-induced hazards) and indirectly SDG 16, peaceful and inclusive societies for sustainable development.

They promote the realisation of the human rights to drinking water and sanitation. At the same time, predominantly subsistence-oriented smallholder farms are promoted. This contributes to SDG 1, Reduce extreme poverty and SDG 2, Improve food security. The targeted promotion of women through advisory and training services strengthens their role in the ACs and within the farmers' organisations. Thus, the project contributes to SDG 5, gender equality and empowerment of women and girls.

Social impacts: Drinking water and wastewater companies and smallholder farms are enabled to use the resource water as efficiently as possible.

Improved institutional frameworks in the drinking water sector and higher operational efficiency of ACs are key factors for increasing the access rate to water and sanitation and a direct contribution to reducing non-monetary poverty (see the inclusion of access to safe drinking water in the *Human Poverty Index*). Improved drinking water supply and sanitation have a positive impact on livelihood security and the containment of diseases among the population (indirect impacts). Farmers at the end of the irrigation canals benefit from an optimised and efficient provision of water for irrigation (increased distributive justice) and more economical use by upstream farmers (increased water availability). This secures or increases agricultural yields and incomes. The water-efficient, income-generating

measures with a focus on women groups improve household income in the communities. Likewise, households are sensitised to better protect the dwindling water resources through efficient use of the drinking water on offer.

Economic impacts: The measures to strengthen operational management and reduce water losses, as well as energy savings during operation, lead to better service delivery to the population, lower operating costs, and increased fee collection. This will enable ACs to achieve a more financially sustainable operation. This enables the nationally driven reduction of state subsidies for public services and thus relieves the state budget. The continuation of the modernisation of the irrigation infrastructure in the Nile Delta, the upgrading of agricultural extension services for smallholder farmers to make more efficient use of the increasingly scarce supply for irrigation contribute to stabilising or increasing farm yields and irrigation efficiency.

Ecological impacts: In drinking water supply and wastewater management, more efficient operational management of the ACs will result in an improvement in the supply of the Egyptian population. At the same time, water resources will be used as effectively and efficiently as possible. Compliance with legal requirements in the operation of wastewater treatment plants and the controlled use of sewage sludge will help to reduce water pollution and the resulting destruction of the environment. In addition, the emission of harmful climate gases is reduced through energy conservation or the energetic use of sewage sludge. Measures to modernise irrigation infrastructure and involve water users contribute to more efficient irrigation and more effective use of the increasingly scarce water supply. The adaptation of crop rotations (cropping patterns) of smallholder farms to climate change and new irrigation practices and the improved exchange of information between MALR and MWRI contribute to the integrated management of water resources.

Conclusions for conception of the module: The TC module focuses on integrated water resource management with special attention to climate change impacts, civil society involvement, focus on water security and water efficiency, and prevention of water pollution through untreated wastewater. Thus, the module contributes to the three dimensions of sustainability.

Markers and cross-cutting themes are summarised in a table in Annex 4.

Results of the in-depth environmental and climate

6.2 Assessment of the risks to the effectiveness of the module

Political risk: For both political partners (MoHUUC and MALR) there are risks that the framework conditions are changed to the detriment of the functioning of the sectors and that they exceed their mandate in certain decisions (e.g. investments, service provision) and thus intervene in subordination in the subordinate structures. This also includes the risk regarding the legal and political framework for the involvement of civil society organisations in project activities. This can jeopardise progress in both sectors.

As with the previous project, misunderstandings on the Egyptian side regarding the involvement of MALR in the project cannot be completely ruled out with regard to the bilateral agreements reached.

In addition, conflicts between the project management unit in the MoHUUC financed by the World Bank and the HCWW must be expected. Disputes at this level would have a lasting negative impact on sector development (for example by curtailing HCWW's responsibilities).

There is a risk that the MWRI will not take up the offer of greater cooperation in water demand planning and consultation with water user groups.

This could jeopardise cooperation between the relevant departments of the agricultural and irrigation authorities at the governorate level.

The above-mentioned risks cannot be directly influenced by the project and must be tracked at the level of political dialogue with the partner ministries.

The political risk is medium and the ability to influence is low.

Implementation risks: The state-imposed uniform tariff in the water sector puts smaller ACs at a disadvantage. Among other things, this can lead to bottlenecks in the provision of personnel for the implementation of measures. Risks associated with this can be reduced by involving the ACs at an early stage in the design of the measures. In irrigated agriculture, it cannot be ruled out that cooperation between the subordinate structures (departments of the agricultural and irrigation authorities at governorate level, water user groups) cannot be realised as planned. This would jeopardise the use of data for water demand planning. Further implementation risks arise from the unclear role and unsustainable business models of the cooperatives, as well as technical and logistical problems of the advisory service.

Risk mitigation measures, such as the increased use of digital media for agricultural extension, are anchored in the methodological approach (output 3). The implementation risks are medium, the influenceability medium.

Risk for long-term anchoring: There is a risk that the MoHUUC interferes in the areas of responsibility of the HCWW and thus jeopardises the well-established separation between political control and service delivery. Furthermore, there is a latent risk that due to insufficient capacities in the Ministry of Agriculture, the measures can not be sustainably implemented and anchored in the governorates. In view of a marked underfunding of agricultural extension services, it is not foreseeable whether the increase in water use efficiency can be implemented in a target-oriented manner. The risk for long-term anchoring is high, the influenceability low.

Environmental and social impacts of the measure: The challenges in the integrated management of scarce water resources and the already noticeable impacts of climate change will lead to a deterioration of basic living conditions and socio-economic development

Results of the in-depth environmental and climate

prospects in Egypt. This will particularly affect people working in agriculture in the Nile Delta. Project measures are directly aimed at the protection and conservation of water resources. Improvements in irrigated agriculture and better operational management in water supply and wastewater management lead to more efficient use of water resources and reduce water pollution. Overall, this safeguards elementary living conditions and preserves socio-economic development prospects. The risk of negative environmental and social impacts of the measure is rated as low, the influenceability is medium.

Corruption risks: Direct corruption risks are assessed as low, as no procurement measures are carried out by the partners as part of the project. In the case of direct implementation by the project, standard processes and control mechanisms of GIZ are consistently applied. Corruption risks in internal processes of partner organisations are considerable. This can be reduced by introducing transparent procedures, e.g. for collecting fees and for spare parts procurement and syotage/ warehousing. The impact of the measure on direct corruption risks is low, the influenceability on internal processes of partner organisations is medium.

The **overall risk is** classified as "medium" and its influenceability through risk management measures is classified as "medium".

Risk	Classification	Influenceability*	Risk management measure
Political risks			
MoHUUC changes the policy framework (e.g. responsibilities of HCWW and ACs). Changes in the political framework for cooperation between MALR and MWRI Increasing regulation of the participation of civil society organisations	2	1	The above-mentioned risks cannot be directly influenced by the project and must be tracked at the level of political dialogue with the partner ministries.
Implementation risks			

Results of the in-depth environmental and climate

Insufficient human resources of the smaller ACs to implement measures. Acceptance of the new role of cooperatives. Technical and logistical problems of agricultural extension services and research centres.	2	2	Can be reduced by taking it into account when designing measures. Advice through projects. Advice through projects.
Risk for long-term anchoring			
Changes in the policy framework so that continuity of service delivery by HCWWs and ACs is not sufficiently ensured. Insufficient efficiency gains in irrigated agriculture to compensate for the reduction in available water resources.	3	1	The risk to long-term anchoring cannot be directly influenced by the project and must be tracked at the level of political dialogue with the partner ministries.
Environmental and social impacts of the measure (unintended effects)			
Risks in connection with project measures are low	1	2	Measures directly target the protection and conservation of water resources in irrigated agriculture and in water supply and wastewater management.
Corruption risks			
Direct corruption risks are low	1	2	In the case of direct implementation by the project, standard processes and control mechanisms of GIZ are consistently applied. Corruption risks in internal processes of partner organisations can be reduced by introducing transparent procedures.
Overall risk	2	2	

*) Levels: 1=low, 2=medium, 3=high, 4=very high