
PALESTINE

APPRAISAL MISSION

**WATER BANKING AND ADAPTATION OF AGRICULTURE TO
CLIMATE CHANGE IN NORTHERN GAZA.**

AGRICULTURE, RURAL DEVELOPMENT & BIODIVERSITY
DIVISION – ZACHARIE MECHALI (19-26 APRIL 2018)

Mission Report
May 2018



PRESENTATION OF THE MISSION

Following an identification mission organized in July 2017 for the development of infiltration, recovery and reuse of treated waste water in Gaza, whereby the concept of the Water Banking and Adaptation of Agriculture to Climate Change Project was developed and submitted internally to AFD and to the Green Climate Fund (in December 2017). Complementary studies were also launched following this first mission, in order to finalize the preparation of the project and update its information in order to fit the standards of AFD and the GCF.

The present mission, composed of Zacharie MECHALI, Task Team Leader at AFD Headquarters, and Hani BOULLATA, Project Manager at the AFD bureau in East-Jerusalem, was conducted between 19 and 26 April 2018 with the objective of appraising the aforementioned project.

The present mission report presents its conclusions, which were presented and discussed with the PWA during a wrap-up meeting.

The mission would like to thank the PWA, the EQA, the Ministry of Agriculture and other stakeholders and institutions met during the mission for their availability and quality of our discussions.

I - DESCRIPTION OF THE PROJECT

The overall “Climate change rationale” (CC rationale) for the project is summarized as follows:

Agriculture, livelihoods and basic needs in Gaza are threatened by warmer temperatures, decrease and high variability of rainfall patterns increasing aridity, increasing water demand from crops (resulting from higher temperatures and lower precipitation) and the raise of the sea level (causing higher infiltration of saline water in the coastal aquifer from which water is extracted mainly for agriculture and drinking), as a result of climate change. The effects of these trends are felt now and their intensity is expected to increase until the end of the century and beyond.

The launching of the NGEST WWTP and, in general, the current development of the Gazan water treatment capacity, offers an important opportunity to bring an additional resource (with regard to the baseline scenario whereby wastewater is not treated and becomes a source of pollution for the aquifer) to the water balance in Gaza and, therefore, increase the resilience of its population and agricultural sector, in the face of climate change adverse impacts.

1.1 - Objectives

The project’s goal is to **develop an integrated and low-emission water management scheme capable of reducing the impact of warmer temperatures, decreasing rainfall and increasing aridity due to climate change, by delivering additional amounts of water usable for sustaining agriculture and increasing the resilience of a highly vulnerable population in the Gaza Strip.**

The specific objectives of the project are as follows:

- O1. Reduce the vulnerability of Gaza’s coastal aquifer and secure sustainability of access to domestic and agricultural water;**
- O2. Promote climate resilient and water-efficient agriculture;**
- O3. Enhance the institutional and operational capabilities for integrated and resilient water management.**

1.2 - Content of the project

The project will deliver infrastructures immediately downstream from the NGEST WWTP that will allow the recharge of the aquifer, using treated waste water (13 Mm³/year), its recovery by a network of wells, its storage and its transfer to an irrigation scheme (15 000 donums ~ 1 500 ha) located in the vicinity of the WWTP.

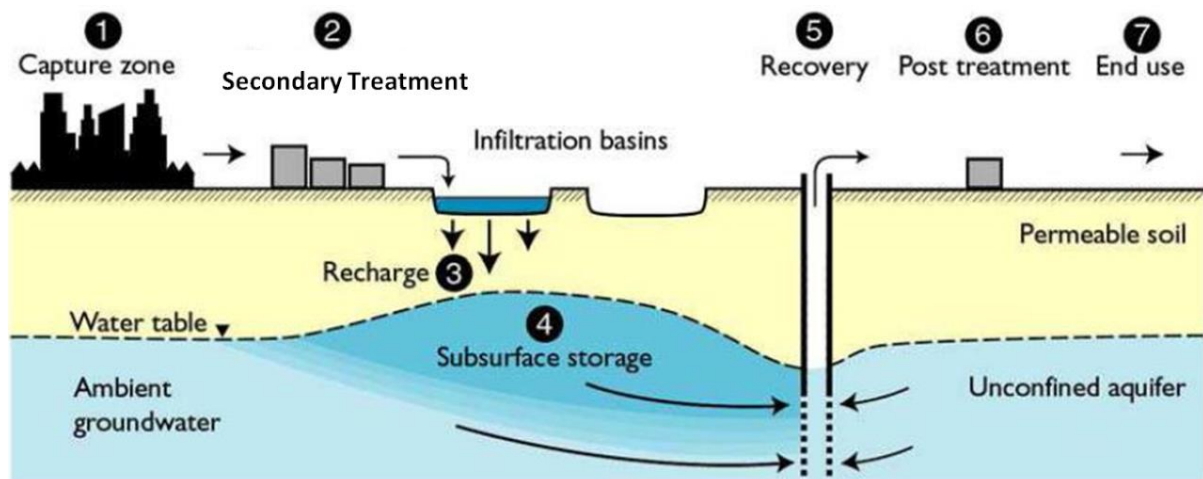
The project has three main components and its theory of change is described in **Annex 1**.

Component 1: Production of additional quantities of water for agricultural use

Main outcomes from this component are:

- Recharge of the aquifer with additional “clean” water (tertiary treatment is implemented through the infiltration process) usable in agriculture;
- The needs of a 15 000 donums irrigation scheme are covered by the infiltration - recovery scheme and agriculture no longer contributes to the depletion of the aquifer; by the same token, it gains resilience and independence with regard to the fluctuation of the aquifer (in quantity and quality) as a result of climate change;
- Infiltration of treated water will contribute to the depollution of the aquifer and mitigate environmental and sanitary impacts of the existing pollution on the Gazan population (see ground water modelling outputs in **Annex 2**).

The following illustration presents the full reuse scheme that will be put into place for NGEST:



Output 1.1 An additional water resource is created by infiltration of treated waste water

Activity 1.1.1 Rehabilitation of 7 infiltration basins for recharge of the aquifer

The belated entry in service of the NGEST WWTP (in 2018 instead of 2015), the dangerous accumulation of raw waste water in the Gaza Strip and the inexistence of alternate solutions in the context of the political relation with Israel, has forced the PA to transfer the waste water from the Beit Lahia WWTP to the infiltration basins located in the NGEST perimeter. For 8 years, very poorly treated wastewater has therefore been infiltrated in the aquifer, creating a pollution plume underground, as well as accumulating residue and clogging the infiltration basins.

The World Bank (WB) has undertaken to rehabilitate 2 of the 9 basins and the project will complete the works (rehabilitation of the 7 remaining basins) to deliver a fully operational infiltration scheme for the recharge of the aquifer.

Activity 1.1.2 Delivery of the recovery scheme

The TWW reuse scheme relies on a tertiary treatment obtained by infiltration through sandy soil and the recovery of the water, stored in the shallow section of the aquifer, by a network of 28 wells located 500 m + 750m downstream from the infiltration point in a concentric formation. The recovered water will converge, through a network of pipes connecting the wells to 2 reservoirs of 4 000 m³ each, in order to manage the distribution according to the needs. **Annex 3** shows how this scheme is organized in space.

Here again, the first part of this investment (14 recovery wells and 1 reservoir) is in the process of being completed under WB financing; the project will implement the second phase of this investment (14 remaining wells and a second reservoir).

Output 1.2: Water – Energy Nexus, development of renewable low-emission energy solutions

Activity 1.2.1 Delivery of 2 PV schemes to sustain the overall needs of the NGEST scheme

Securing the flow of unconventional water to the aquifer and its transfer to agricultural lands depends on the performance of the NGEST plant + Recovery Scheme (NGEST + RS) and, in particular, on the reliability of its power supply (mainly constrained by restrictions on access to electricity due to the geopolitical situation).

The project, in the framework of a partnership between the PWA, PENRA and GEDCO, will set up a total of 7 ha of photovoltaic (PV) panels within the premises of NGEST (4 ha) and

around the recovery scheme (3 ha). This PV scheme will produce 5 MWp of the 15 MWp needed for the overall reuse scheme (WWTP + Recovery + Irrigation).

By adding the PV field to the NGEST compound, the annual supply from the grid in its first year of operation will be reduced by 24% and the required annual energy from the emergency diesel is taken down by 27% allowing the NGEST facility to reduce its diesel consumption by 30%, leading to the saving of 1,3 million liters of diesel fuel. **This will result in lower emissions amounting in 70 989 tCO₂eq over the 20 years lifespan of the project.** Accordingly, the PV share in 2018 reaches 24% of the total annual power generation, the diesel share is 38,8 %, the grid share is 22,2 % and the biogas share is 16%.

The NGEST WWTP + RS power supply without PV and the current supply options lead to an overall Levelized Cost of Energy (LCOE) of 0,23 USD/kWh. **NGEST with the PV option installed has an overall LCOE of 0,2 USD/kWh , making it 0,03 USD/kWh cheaper than the “no PV option”. This will generate a saving in present value of 15,5 MUSD over the lifespan of the project.**

In order to maximize the use of this additional and renewable source of energy, a “net-metering” system will be set-up with GEDCO in order to store the excess energy on the grid and feed it back to the system according to the demand over a period of 12 months (making it possible to buffer the peak in demand during summer time).

| Source | Energy share « with project » | Renewable energy share « no project » |
|--------|-------------------------------|---------------------------------------|
| PV | 24% | 30% |
| Biogas | 16% | |
| Diesel | 38,8% | - |
| Grid | 22,2% | - |

Component 2: Irrigation, water efficiency and climate resilient agriculture

Main outcomes from this component are:

- Agricultural farms and livelihoods are maintained in Northern Gaza ;
- Improved agricultural practices and more efficient use of water are extended to increase the resilience of agriculture to the effects of climate change and implementing climate smart agricultural practices.

This component consists of the delivery of an irrigation scheme of 1 500 ha as well as services provided to the farmers/water users aiming at improving their practices and resilience.

Output 2.1: 1 000 farmers over 1 500 ha benefit from an improved water service for irrigation

Activity 2.1.1: Delivery of an irrigation scheme, 1 500 ha

The project will deliver a distribution network in order to service two irrigated sub areas of 500 ha and 1 000 ha located around the WWTP (see **Annex 3**), corresponding to a total of 126 km of pipeline and the upgrading of the booster station in order to support drip irrigation practices. On-farm investments will be included in the costs supported by the project but will be reimbursed (with a subsidy rate) by the farmers over a 3 years period in order to set up an O&M fund for the WUA. The delivery of the irrigation scheme will take place in three steps: Step 1 = 500 ha; Step 2 = 1 000 ha; Step 3: on-farm equipment (drip irrigation).

The NGEST WWTP, which is operating since March 2018, will generate 35 600 m³/day of treated water, i.e. 13 million m³/y; this represents allocations of about 10 000 m³/ha/y which is sufficient water to sustain agricultural needs (horticulture and vegetable growing) in the context of Gaza. In the current situation, pumping in the aquifer is done through private wells which partially irrigate the 1 500 ha of interest to the project. Each well is owned and managed by shareholders who are the main users of the water and pay the real cost of its extraction (mainly the cost of diesel); non-shareholders may have access to water, but will pay an additional fee apart from the cost of extraction. In any case, water for irrigation is not available on a daily basis and water turns are usually of 10 to 12 days.

The project will support the creation of a Water Users Association (WUA), to which the recovered water will be delivered and sold to and which will have the responsibility of equally distributing it to users through the application of a transparent and approved tariff. The design of the irrigation scheme to be delivered by the project will allow availability of water for all farmers, every day, 12 hours per day. The drip irrigation systems installed by the project will increase on-farm productivity and generate *more crops for the drop*.

Output 2.2: Increased climate resilience of agriculture, adaptation of cropping systems

Activity 2.2.1: Extension services to farmers

In the baseline situation, farmers have little access to advisory services and in the context of limited and fluctuating access to water, cropping patterns practiced by farmers show low levels of profitability and efficiency with regard to water. The feasibility study of the project has shown how changes and transformations at farm level can improve the profitability of agriculture and save water.

Nevertheless, these changes cannot be imposed on the farmers and will need to be evaluated and adapted to the needs on a case by case basis through the provision of professional extension services, to be provided through the project (technical and economic advisory; demonstrations; farmer field schools; training).

The preliminary data obtained through hydrological modeling, as well as analysis of the quality of water extracted from the aquifer show that the water recovered from the wells will be fit for all agricultural uses and according to Palestinian law, the recovered water is equivalent to groundwater, on which no restrictions are imposed (contrary to treated waste water coming directly from the treatment plant and used for irrigation). The high level of nitrogen in the water prevents it from being drinkable but constitutes an advantage for agricultural use (saving equivalent amounts of fertilizer).

Finally, the project will promote the use of treated and disinfected effluent sludge from the NGEST WWTP by the project in order to substitute the use of chemical fertilizers for environmental and economic reasons in line with Palestinian standards and EQA approval.

Support to on-farm activities is the mandate of the Ministry of Agriculture of the Palestinian Authority, which will seek assistance from the Food and Agricultural Organization of the United Nations in order to perform this task in the framework of the project.

Activity 2.2.2: Gender, land tenure and irrigation – a Gender-responsive approach to agricultural resilience

Land tenure is more in favor of men, as a result of a relatively conservative application of *charia* law in the context of rural communities in Gaza (women only inherit less fractions of a share of the parents' land than men). Therefore women rarely own land and when they do, they frequently relinquish its use to other men of the family (generally their brothers due to some social customs and cultural traditions). This reality is strongly embedded in a relatively rigid and complex cultural apparatus, which the project will have no power to change.

Nevertheless, the project will investigate (through an initial diagnostic during inception phase) opportunities whereby women could gain access to the land they own or improve their use of land they already have access to, by increased access to water and technical services provided by the project. These opportunities will be sought through a process of community involvement, whereby family and community members instrumental in establishing these channels of improved access to land. Of course, the first step of the community involvement around the issue of “irrigation and gender” will be to mobilize the women in the communities, in order to understand their needs, objectives and “hidden agendas”.

Through a diagnostic and community mobilization work, it is expected that a group of women willing to embark on a process of improved access to land and water will be formed, sponsored by the community. This group of women will be supported by the project (namely through a methodology developed by the FAO¹, that will be adapted to the context of Gaza) through *positive action* with regard to access to water (see hereunder, participation of women to the governance of the WUA) and technical services in order to develop intensive and quality cropping (gardening) on their micro-plots of land.

As a second step, if possible/needed/wished, the group of women will be supported in forming into a cooperative in order to market their products or to create food banks for their families, according to their objectives.

This activity will be coordinated by the Ministry of Agriculture and FAO and will involve local social society organizations.

Component 3: Management of the Water Cycle and Capacity Building of Agents

Main expected outcomes from this component are:

- Improved water governance (co-management with users) and increased water efficiency in the context of growing aridity;
- Sustained operation and maintenance of adaptation infrastructure.

This component represents the institutional aspect of the project, which in the context of « reuse of waste water » and its multiple stakeholders and need for coordinated action, is of particular importance.

¹ See : www.fao.org/3/a-be879e.pdf

Output 3.1: The PWA and Ministry of Agriculture are strengthened in their respective role of coordination and quality control of the process of reuse of treated wastewater

Activity 3.1.1: Technical assistance

The PWA is the main implementing agency of the project and will be responsible for all the infrastructures that will be delivered through the project; for the establishment of the irrigation scheme (in particular the on-farm investments) and the “soft” components, it will coordinate with the Ministry of Agriculture and the FAO.

An international technical assistance will be provided to assist the PWA and Ministry of Agriculture (MoA) for the duration of the project, aiming at providing support on the following aspects:

- Overall management of the project and, particularly, of the “works”;
- Assist PWA and the MoA in setting up the overall management scheme of a public irrigation system;
- Quality control of the water infiltrated and recovered, setting-up of a monitoring system and establishment of a communication plan and media with the farmers ;
- Monitoring and evaluation of the outputs of the project;
- Implementation and monitoring of the ESMP (Environment and Social Management Plan).
- Assist the PWA in responding to reporting (GCF, AFD and PNA) requirements during the project implementation period;
- Training for the operational staff on management aspects to ensure the smooth operation for the recovery and the irrigation systems.

This TA will be integrated within the PMU at the PWA in and will accompany the PWA and the MoA during the duration of the project. It will be acquired through an international bidding process.

Activity 3.1.2: Setting-up of a monitoring and water quality control system

The PWA, in coordination with EQA, will be in charge of establishing and implementing monitoring procedures to supervise the water infiltrated in the aquifer and that recovered through the wells downstream in order to guarantee the quality of the water delivered to the irrigation scheme. The system will rely on 15 monitoring wells equipped with measurement probes (10 already implemented and 5 to be financed through the project). The project will also support the setup a laboratory for the PA and the capacity building of the staff employed in the laboratory in charge of performing the quality tests. The PWA will procure as well equipment needs for the MoA to upgrade their laboratory to monitor the quality of the agriculture products as per their mandate.

The monitoring system is a central piece of the ESMP of the project and will provide the information and data necessary to sustain a quality and transparent communication and dialogue between the water provider and the end-users in order, namely, to fine tune agricultural practices and cropping patterns to quality and quantity of the water delivered to the irrigation scheme.

A short feasibility study will identify the exact requirements to determine the equipment needed for the PA entities in line with the Water Law of 2014 and to establish the specifications and quantities. The feasibility study will also compare the efficiency of the public serviced laboratories vs. subcontracting such services to the private laboratories. The equipment will be procured through a supplies contract through PWA/PNA procurement procedures.

Output 3.2: Exit Strategy and Transfer of O&M to Water Users

As per the 2014 Water Law and recently approved by-laws (2018), hydraulic infrastructure must be jointly managed between the public sector and the users themselves and, when possible, be transferred to full management by the users. This co-management or co-operation has both an institutional (establishment and capacity building of a WUA) and financial dimension (cost-sharing of investments and O&M) that gives birth to a transaction between a water provider and a water user, at a certain tariff and to a set of rules and procedures for the management of the infrastructure.

Several co-management scenarios exist and determining the appropriate one in the context of the project is the result of a consultation and feasibility process (including a tariff and “willingness to pay” study) that will be undertaken, in the first few months of the project with the support of the FAO, locally with the farmers/water users/land and well owners of the irrigation scheme.

A possible scenario, that will necessarily be tested and adapted through the process described above, could be as follows:

1. The PWA would own (and for the first few years, also operate) the Recovery and Reuse Systems with the ultimate goal of transferring the recovery wells, reservoirs and booster station to National Water Company and the Reuse scheme operation and management to the Water Users Association (WUA);

2. This would imply that:

- PWA would own the Recovery System, and operate until the establishment of NWC;
- PWA would own the Reuse System, and operate it for the first 3 years of the project;
- During the first three years the WUA and Ministry of Agriculture in addition to PWA would receive intense capacity building;
- After the first three years of the project, the WUA would assume operation and management of the Reuse systems;
- PWA would continue to own the systems.

3. The farmers will own and be responsible for operation of the On-Farm System (tertiary drip irrigation network), with the support of the WUA helping to coordinate farmers for technical assistance and capacity building with modern irrigation techniques and the proposed cropping pattern.

In financial terms, the sustainability and replicability of the project depends on the involvement of various donors, government and farmers, as per their capacity to cover the following costs:

- (1) Capital Investment for the Water Recovery Scheme;
- (2) Capital Investment for the Water Reuse (irrigation) Scheme up to Farm's Gate;
- (3) O&M costs for the Water Recovery Scheme;
- (4) O&M costs for the Water Reuse (irrigation) Scheme;
- (5) Capital Investment for Farm's Development.

At this stage, the preferred scenario involves Capital and O&M subsidies from the Government, in a context of high vulnerability of the population. Costs (1) and (2) will be paid by the Government/Donors. Costs (3) and (4) would be subsidized by the Government only until Farmers have paid back cost (5). Farmers are expected to pay for the development of their own farm. All other costs are paid by the Government/Donors for the first 3 years (i.e. the time it takes for the farmers to be able to pay back the improvement of their farm). After that point, farmers will be responsible for paying O&M costs for the whole system (evaluated at 0.33 USD/m³ and would need the WSRC validation as per the 2014 water law).

Activity 3.2.1: Identification and establishment of the co-management scheme – Structuring and capacity building of a WUA

Any scenario of co-management to be established during the lifetime of the project implies that:

- The WUA to be created will be rapidly functional and have the adequate level of capacities to dialogue with the water provider and properly negotiate the financial and non-financial conditions whereby effective co-management and cost-sharing will enter into force;
- The farms, constituting the economic entities using the water, have been sufficiently supported by the project – and first economic outcomes of this support hopefully observed- in order to create the necessary resources and incentives to participate in the costs of O&M of the scheme.

Setting-up and support to WUAs is the mandate of PWA and the Ministry of Agriculture of the PA; for the purpose of this project, it will be assisted in its mandate by the FAO, as its implementation partner, through which other institutions and NGOs may also be involved.

Activity 3.2.2: Integration of women in the governance bodies of the WUA

If any change is to be supported with regard to access of women to land and water, it is essential that positive action be taken to ensure that women are represented in the bureau of the WUA and have effective means of taking part in the decision making with regard to water allocations and access to the irrigation network.

Output 3.3: Communities are empowered and relieved, in the context of the conflict in Gaza

Activity 3.3.1: Diagnostic and analysis of the conditions of recovery and reclamation of unused land within the irrigable area

The area of the project is located near the border with Israel, at a location through which incursions by the Israeli Defense Forces (IDF) have occurred in the past. This has generated casualties, destruction of agricultural land and, as a result, stress and trauma amidst the population and farmers. As it is the case in other parts of Palestine, in particular in occupied areas of the West Bank, this has consequences on the state of mind and psychological welfare of the populations, affecting negatively human interactions within the communities (capacity to resolve conflicts and to work together) and also households. In turn, this situation has implications, in the project area, on the capacity of farmers to return to land affected by military interventions and to work together in community-based or collective water management (WUA) and agricultural (cooperatives) activities.

This support will be delivered by MoA through the FAO, which will mobilize other specialized organizations to perform the diagnostics and analysis study.

Activity 3.3.2: Psychosocial support and strengthening of community and household bounds

As suggested above, transfer to users of hydraulic infrastructure and community based organizations will have a chance to work and perform only if the women and men that constitute them are capable of interacting positively to reach a common goal. In the context described above, and based on a more detailed baseline study to be performed during the inception phase, the project will design and provide a psychosocial support package to the communities including collective and individual services aiming at re-boosting the community dynamics. A particular set of services and activities will target women and their position within the family – linking with the issue of their access to land described above.

This support will be delivered through the FAO, which will mobilize other specialized organizations to implement the support package(s).

Output 3.4: The outputs/outcomes of the project are capitalized and serve their replication and upscaling in the context of the Palestinian adaptation to climate change strategy

Activity 3.4.1: Analytical work

The project will help deliver the first large scale reuse of waste water scheme in Palestine. The process of its establishment and the quality of its related services, outputs and outcomes will need to be documented, analyzed through independent expertise, in order for the experience to be evaluated with credibility and, eventually, replicated and/or up-scaled (the overall waste water treatment capacity of Gaza will keep growing over the years).

The project will therefore provide resources to perform such analytical work during the project life time that will be implemented through research institutes and universities. The analysis work can as well become part of the work of the Technical Committee for Agricultural Water (Costea - <https://www.comite-costea.fr/>), which can bring together French expertise in agricultural and water.

In addition, this activity will provide the required resources to perform a mid-term and final evaluation that will be implemented by a consultancy company following the AFD procurement procedures by the WSRC.

II - IMPLEMENTATION ARRANGEMENTS

Institutional arrangements

The PWA will be the lead implementing agency for the project and will be in charge of the overall coordination of the activities and of the “hard” components of the project (i.e. delivery of the infrastructure). AFD will sign a grant agreement with the Ministry of Finance and Planning in Ramallah, which will sign an on-granting agreement with the PWA.

The PMU within the PWA will be responsible for all tendering activities for capital investments and for the financial management of the project.

The PWA/PMU will be assisted in its project management tasks by an international TA.

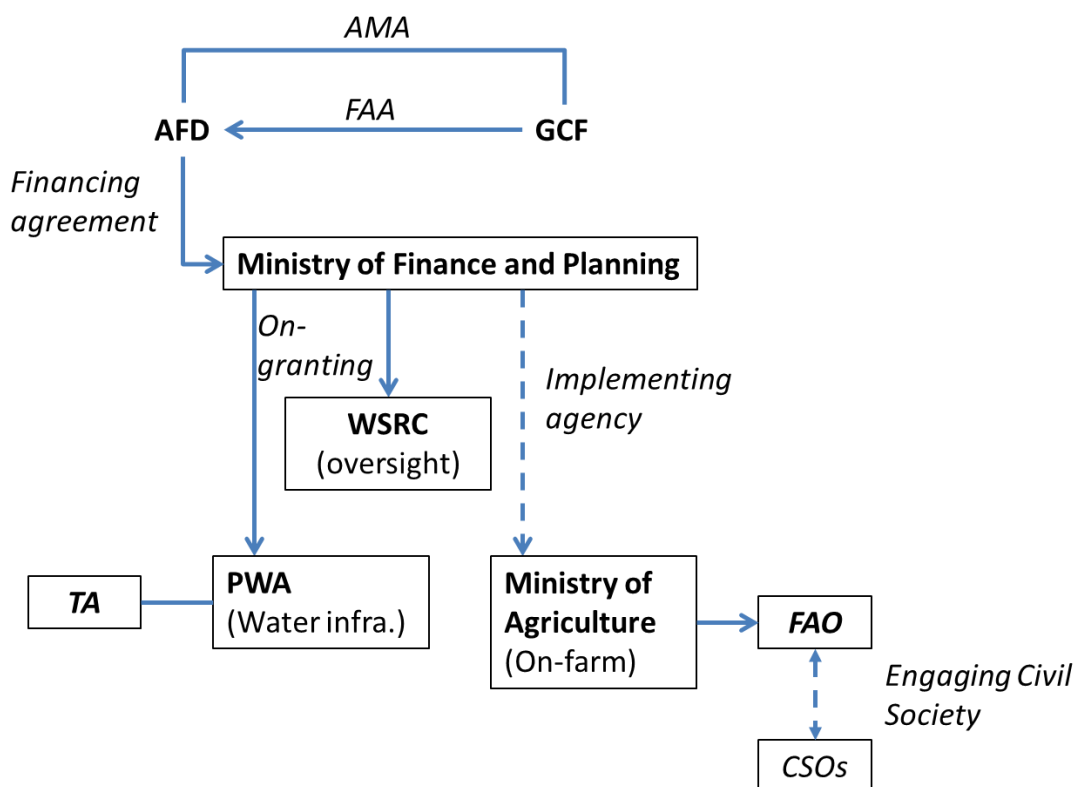
For those activities located outside the mandate of the PWA, related to on-farm activities, the Ministry of Agriculture of the PA will take over the implementation. As it has been mentioned above, in doing so, the Ministry will seek the assistance of the FAO as its Implementing Partner for Outputs 2.2, 3.2 and 3.3; it will do so through the signing of a project agreement detailing the technical and financial characteristics of this cooperation and which will be submitted to the Steering Committee (see hereunder) and AFD for financing within the project. The organic and prior relationship existing between the MoA and the FAO, as well as specific knowledge and know-how of this organization in the context of Palestine and Gaza justifies that this United-Nations Organization be directly involved in the project, alongside the MoA.

Based on the FAO know-how and previous experience in Gaza, the FAO will engage Civil Society Organizations (CSOs) according to its sets of rules and regulations to implement parts of the tasks within 2.2, 3.2 and 3.3.

The evaluation and monitoring of the overall “Reuse scheme” (from the WWTP to the irrigation scheme and its WUA) is the responsibility of the Water Sector Regulatory Council (WSRC), according to the Palestinian Water Law. In order to ensure alignment on existing Palestinian institutions and laws, the project will rely on the WSRC to perform an independent periodical

monitoring and evaluation of the overall reuse scheme. The WSRC will be in charge of launching and monitoring the mid-term and final evaluation of the project referred to under activity 3.4.

Therefore, two on-granting agreements will be signed between the MoFP and the PWA, on the one hand, and the WSRC on the other. The institutional set-up of the project is summarized by the following figure:



A Steering Committee will be established to ensure appropriate coordination between stakeholders of the project (PWA the Chair, EQA, PENRA, MoFP, CMWU, MoA/FAO, WSRC), to take strategic decisions and to guarantee good information sharing; the Committee will be conveyed twice a year. The WUA, as soon as it is established, shall also be included as a member of the Committee.

A Technical Committee, limited to Implementing agencies (PWA the Chair, EQA, MoA/FAO, WSRC, MoFP) shall also be created for more periodical and operational decision making.

III - BUDGET AND FINANCING

The following table summarizes the budget lines of the project and allocations between donor agencies, taking into account discussions with the PWA, as well as trying to fit, as well as possible, the investment criteria of the GCF. In applying these constraints to the budget, it appears that an overall contribution of 13 MEUR is needed from AFD, which due to budgetary constraints will be provided in two tranches, the first one during this fiscal year (10 MEUR) and a potential second in 2019 (3 MEUR).

| Project / Donor agency (EUR) | AFD | GCF | Total |
|---|------------------|-------------------|-------------------|
| C.1. Production of additional quantities of water for agricultural use | 800 000 | 12 850 000 | 13 650 000 |
| <i>Output 1.1 An additional water resource is created by infiltration of treated waste water</i> | 800 000 | 6 338 500 | 7 138 500 |
| <i>Activity 1.1.1 Rehabilitation of 7 infiltration basins for recharge of the aquifer</i> | 800 000 | | 800 000,00 |
| <i>Activity 1.1.2 Delivery of the recovery scheme</i> | 0 | 6 338 500 | 6 338 500 |
| <i>Output 1.2: Water – Energy Nexus, development of renewable low-emissions energy solutions</i> | 0 | 6 511 500 | 6 511 500 |
| <i>Activity 1.2.1 Delivery of 2 PV schemes to sustain the overall needs of the NGEST scheme</i> | 0 | 6 511 500 | 6 511 500 |
| C.2. Irrigation, water efficiency and climate resilient agriculture | 9 500 000 | 9 200 000 | 18 700 000 |
| <i>Output 2.1: 1 000 farmers over 1 500 ha benefit from an improved water service for irrigation</i> | 9 500 000 | 8 000 000 | 17 500 000 |
| <i>Activity 2.1.1: Delivery of an irrigation scheme, 1 500 ha</i> | 9 500 000 | 8 000 000 | 17 500 000 |
| <i>Output 2.2: Increased climate resilience of agriculture, adaptation of cropping systems</i> | 0 | 1 200 000 | 1 200 000 |
| <i>Activity 2.2.1: Extension services to farmers</i> | | 1 000 000 | 1 000 000 |
| <i>Activity 2.2.2: Gender, land tenure and irrigation – a Gender-responsive approach to agricultural resilience</i> | | 200 000 | 200 000 |
| C.3. Management of the Water Cycle and Capacity Building of Agents | 1 382 000 | 750 000 | 2 132 000 |
| <i>Output 3.1: The PWA is strengthened in its role of coordination and quality control of the process of reuse of treated waste water</i> | 800 000 | 150 000 | 950 000 |
| <i>Activity 3.1.1: Technical assistance</i> | 800 000 | 0 | 800 000 |
| <i>Activity 3.1.2: Setting-up of a monitoring and water quality control system</i> | | 150 000 | 150 000 |
| <i>Output 3.2: Exit Strategy and Transfer of O&M to Water Users</i> | 400 000 | 100 000 | 500 000 |

| | | | |
|---|-------------------|-------------------|-------------------|
| <i>Activity 3.2.1: Identification and establishment of the co-management scheme – Structuring and capacity building of a WUA</i> | 400 000 | 0 | 400 000 |
| <i>Activity 3.2.2: Integration of women in the governance bodies of the WUA</i> | | 100 000 | 100 000 |
| <i>Output 3.3: Communities are empowered and relieved, in the context of the conflict in Gaza</i> | 182 000 | 200 000 | 382 000 |
| <i>Activity 3.3.1: Diagnostic and analysis of the conditions of recovery and reclamation of unused land within the irrigable area</i> | 182 000 | | 182 000 |
| <i>Activity 3.3.2: Psychosocial support and strengthening of community and household bounds</i> | | 200 000 | 0 |
| <i>Output 3.4: The outputs/outcomes of the project are capitalized and serve their upscaling in the context of the Palestinian adaptation to climate change strategy</i> | | 300 000 | 300 000 |
| <i>Activity 3.4.1: Analytical work</i> | 0 | 300 000 | 300 000 |
| Operational costs of the PMU (PWA) | 400 000 | 238 000 | 638 000 |
| Monitoring and evaluation (WSRC) | 400 000 | 0 | 400 000 |
| Contingencies | 518 000 | 962 000 | 1 480 000 |
| Total (EUR) | 13 000 000 | 24 000 000 | 37 000 000 |

In general, disbursements will mainly be made in the form of direct payments to contractors recruited by the PWA, and will be validated by MoFP controller at PWA, for the “hard” components and to the FAO for the on-farm and “soft” activities. If needed, a special account at PWA – Ramallah level could be opened for operational costs, for a cumulated amount not exceeding 500 000 EUR.

Disbursements modalities:

- Infrastructure capital investment and studies: to be commissioned in line with AFD Financed Contracts in Foreign Countries and direct disbursements from AFD to contractors/consultants based on PWA requests.
- Payments for the operational budgets for PWA can be performed through a renewable advance mechanism in line with AFD procedures
- Payments to the FAO, based on the partnership agreement with the MoA, will be made directly by the AFD in the form of annual installments, upon request from the MoA, to be renewed on the basis of an annual technical and financial reporting that reflects the progress of the tasks defined in the agreement and in line with AFD procedures.
- Payments for the Monitoring and Evaluation budget for WSRC can be performed through a renewable advance mechanism in line with AFD procedures

IV - MAIN CONDITIONS PRECEDENT

The following conditions, discussed with the PWA during the mission, will be applied to AFD funding:

Conditions precedent to be satisfied on the signing date of the financing agreement:

- (i) Nomination by the Minister of PWA of the members of the project management unit in Ramallah and in Gaza;
- (ii) Nomination by the Minister of Agriculture in Ramallah of the focal persons of the Ministry of Agriculture in Gaza to be involved in the implementation of the project;
- (iii) Transmission by the Minister of PWA of a document detailing the management scheme of the NGEST infrastructures (WWTP and recovery scheme) during the transitional period (prior to the creation of the National Water Company), as well as the means by which the O&M costs will be covered;
- (iv) Formal agreement by the PA/PENRA for the establishment of a “net metering” system (1 MW for 1 MW) with GEDCO for the PV scheme financed under the project;
- (v) Establishment of an implementation agreement between MoA and the Implementing Partner (FAO), including a work plan and detailed budget for implementation of Sub-components 2.2 and 3.2 ;

Conditions precedent to the first drawdown

- (vi) Signing of an on-granting agreement between MoFP and the PWA for the activities it will implement;
- (vii) Signing of an on-granting agreement between MoFP and WSRC for the activities it will implement.
- (viii) Establishment of a Steering Committee including chaired by PWA, and members from EQA, PENRA, CMWU, MoA/FAO, WSRC and MoFP

Covenant

The PNA commits to the setting-up and support of a WUA related to the irrigation scheme supported by the project and to ensuring the conditions of a progressive transfer of the O&M of the reuse scheme to this association. Once established, the WUA will become a member of the Steering committee.

V - NEXT STEPS AND SUBMISSION OF THE PROJECT TO THE GCF

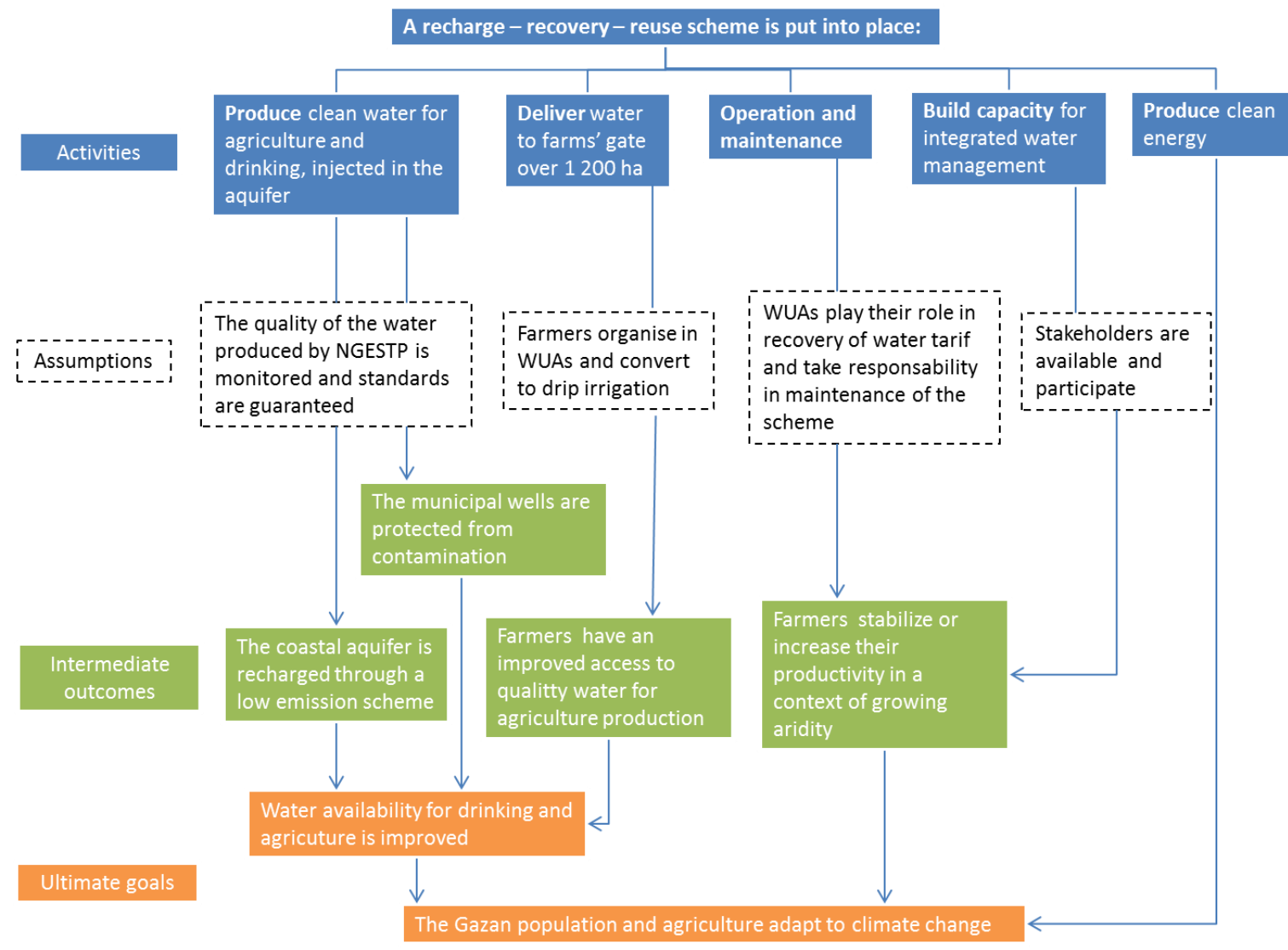
AFD and the PNA/EQA (NDA) wish to present the co-financing sought from the GCF at the B.21 in October 2018.

In order to do so, the Funding Proposal (FP) must be developed and submitted to the Fund's Secretariat by the 25th of June. The two complementary studies underway (updating of design/Gender Action Plan and of ESIA/ESMP/RAP) must therefore be completed by 20th of June, date by which AFD will need to submit the FP to the NDA's speedy no-objection before submission to GCF.

Indicative work plan (TBD in cooperation with PWA)

[illegible]

ANNEX 1: THEORY OF CHANGE



ANNEX 2 : GROUND WATER MODELLING

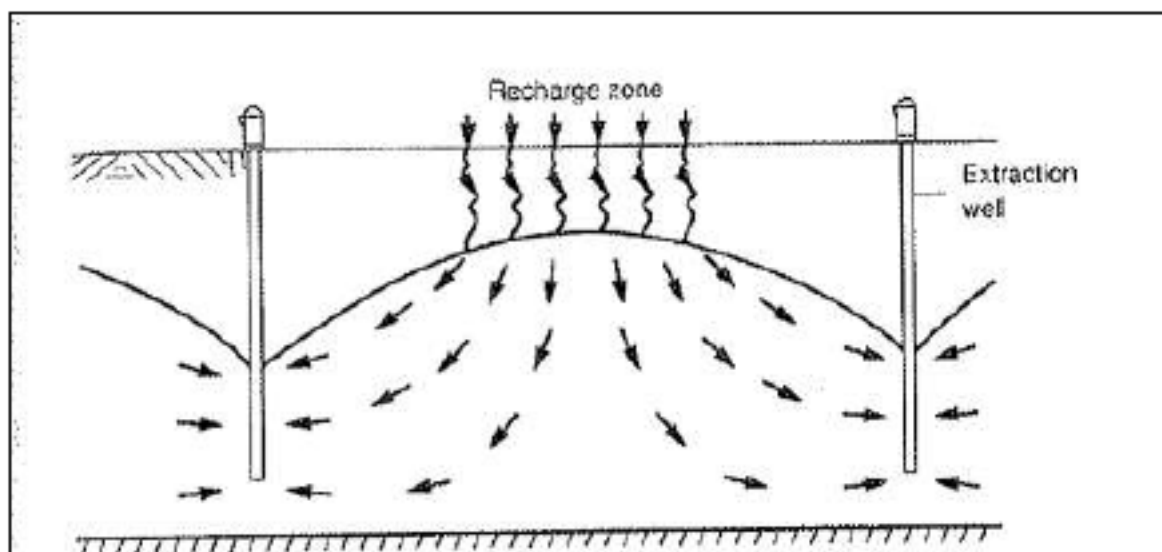
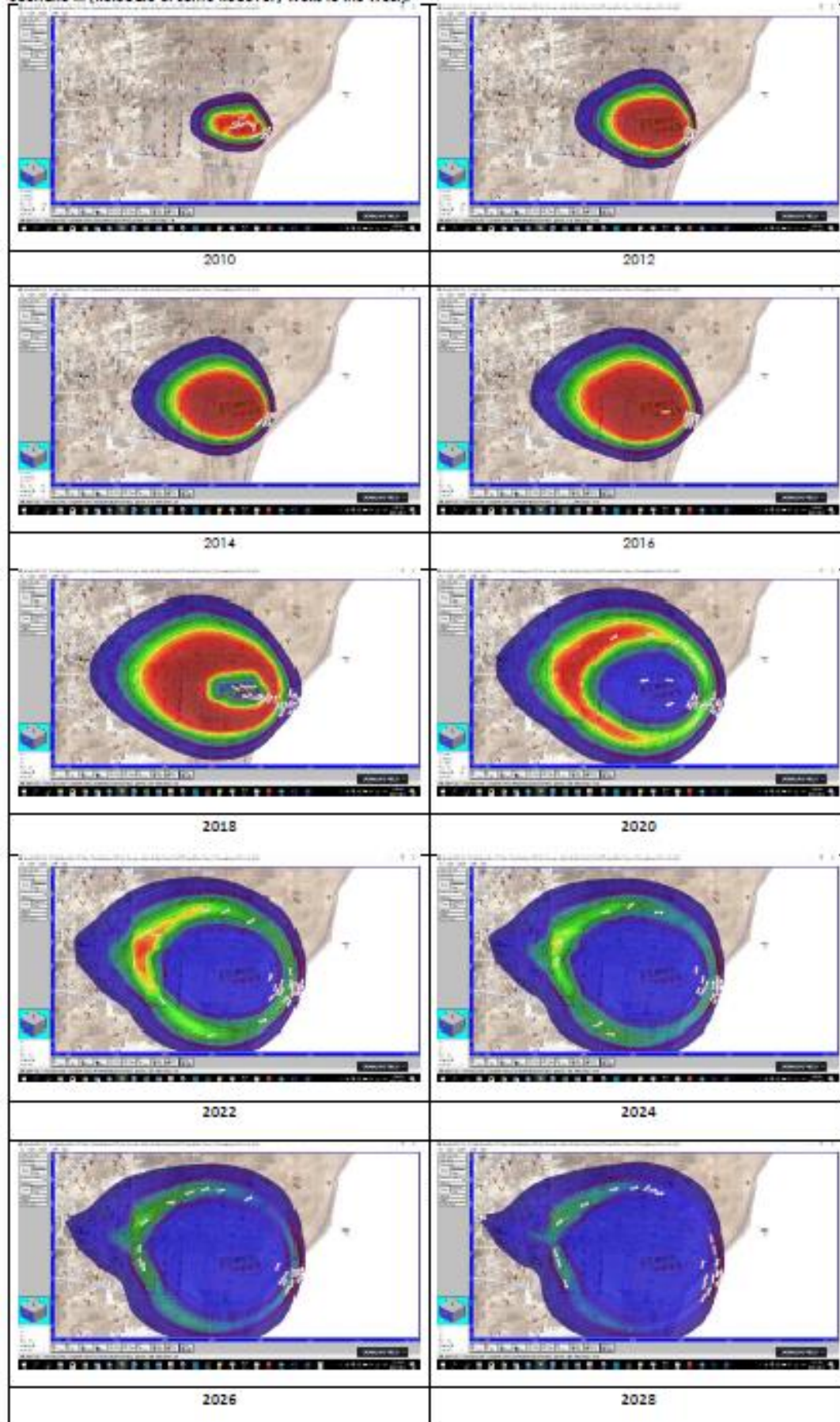


Fig. 4.1: Schematic sketch of Nordic groundwater recharge by surface spreading.

Scenario III (Relocate of some Recovery Wells to the West):



ANNEXE 3: SPATIAL ORGANIZATION OF THE PROJECT

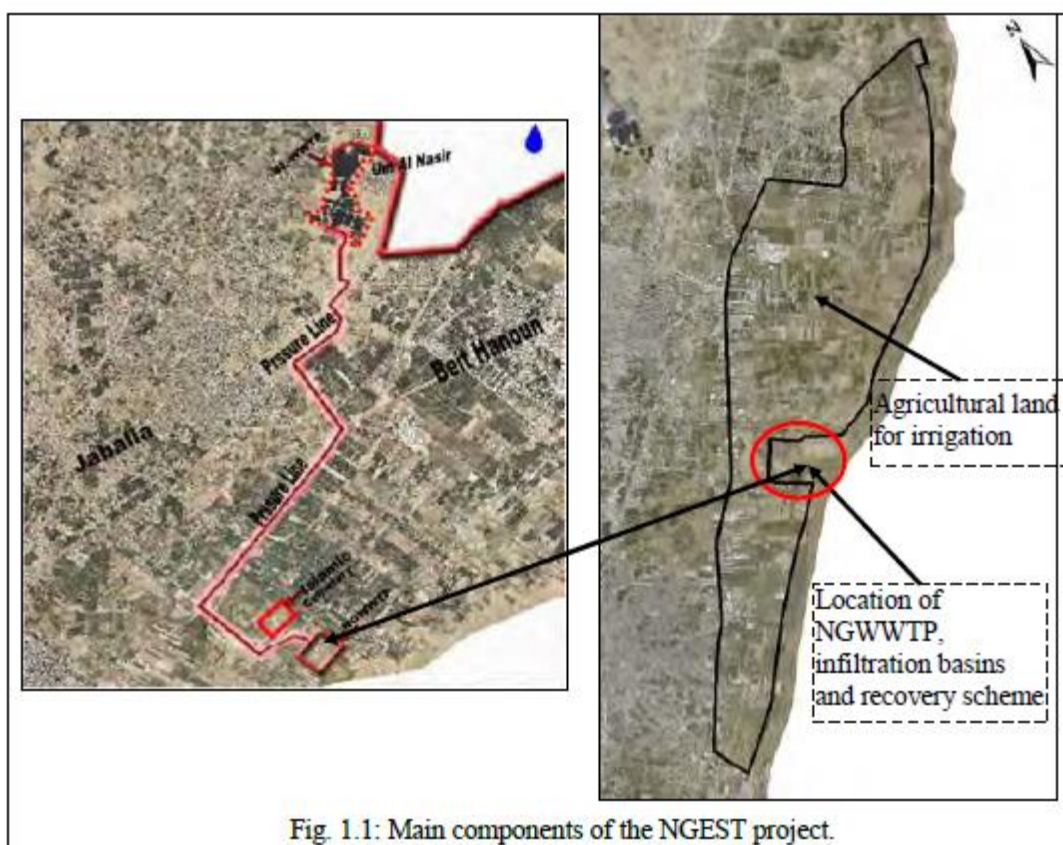
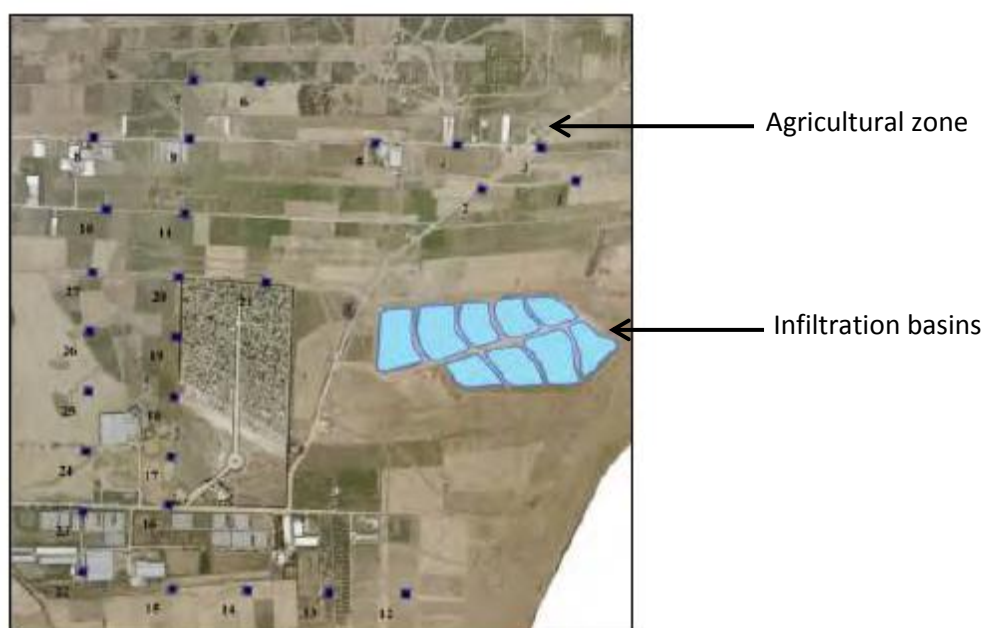


Fig. 1.1: Main components of the NGEST project.

