

Concept Note

Water Banking and Adaptation of Agriculture to Climate Change in Northern Gaza

Palestine | Agence Française de Développement (AFD)

25th November 2017



**GREEN
CLIMATE
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Project/Programme Title: **Water Banking and Adaptation of Agriculture to Climate Change in Northern Gaza**

Country(ies): Palestine

National Designated Authority(ies) (NDA): Environment Quality Authority (EQA)

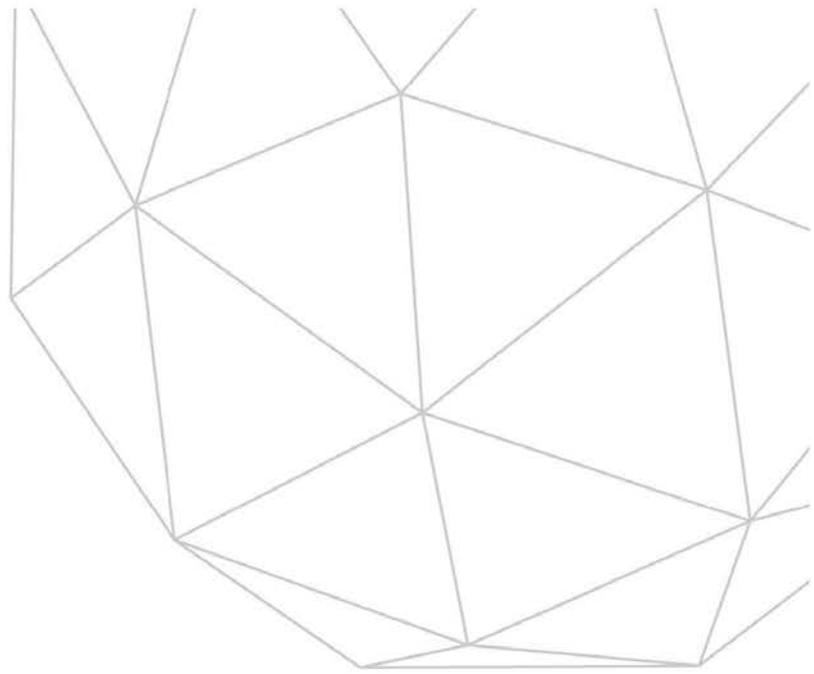
Accredited Entity(ies) (AE): French Development Agency (AFD)

Date of first submission/
version number: [2017-11-21] [V.0]

Date of current submission/
version number [YYYY-MM-DD] [V.0]



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Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

The Accredited Entity is encouraged to submit a concept note, in consultation with the National Designated Authority, to present a project or programme idea and receive early feedback and recommendation.

Notes

- The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days.
- As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential.
- The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt.
- NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any.
- Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF).
- Further information on GCF concept note preparation can be found on GCF website [Funding Projects Fine Print](#).

A. Project / Programme Information (max. 1 page)			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to an RFP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, specify the RFP: _____	A.4. Confidentiality ¹	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project/programme	<p><u>Mitigation</u>: Reduced emissions from:</p> <input checked="" type="checkbox"/> Energy access and power generation <input type="checkbox"/> Low emission transport <input type="checkbox"/> Buildings, cities and industries and appliances <input checked="" type="checkbox"/> Forestry and land use <p><u>Adaptation</u>: Increased resilience of:</p> <input checked="" type="checkbox"/> Most vulnerable people and communities <input checked="" type="checkbox"/> Health and well-being, and food and water security <input type="checkbox"/> Infrastructure and built environment <input checked="" type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO ₂ eq over lifespan)	71 000	A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	200 000 (50% of Gaza City population)
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 42 500 000	A.9. Indicative GCF funding requested	Amount: USD 32 000 000
A.10. Mark the type of financial instrument requested for the GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input type="checkbox"/> Senior Loan <input type="checkbox"/> Other: specify _____		
A.11. Estimated duration of project/ programme:	Disbursement period: 2019-25	A.12. Estimated project/ Programme lifespan	20 years
A.13. Is funding from the Project Preparation Facility requested? ²	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Other support received <input type="checkbox"/> If so, by who: _____	A.14. ESS category ³	<input type="checkbox"/> A or I-1 <input checked="" type="checkbox"/> B or I-2 <input type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, specify the status of AMA negotiations and expected date of signing	A.18. Is the CN included in the Entity Work Programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	<p>The main strategic focus of the Palestinian National Adaptation Plan (NAP) is about reducing water and food insecurity, which is well aligned with the Palestinian NDC. According to the NAP, many sectors in the Gaza Strip are considered to be particularly vulnerable to the negative consequences of climate change and its effects on decreasing water resources.</p> <p>Already under significant pressure from rapid demographic growth, economic development and restrictions on water mobilization investments, freshwater resources in Palestine are predicted to become scarcer. Climate change causes decreases in annual precipitation and one of the impacts of rising temperatures is the increase in</p>		

¹ Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy ([Decision B.12/35](#)) and the Review of the Initial Proposal Approval Process ([Decision B.17/18](#)).

² See [here](#) for access to project preparation support request template and guidelines

³ Refer to the Fund's environmental and social safeguards ([Decision B.07/02](#))

water demand from crops.

The project will **develop an integrated and low-emission water management scheme capable of reducing the impact of increasing aridity due to climate change, while depolluting a strategic aquifer for the population of Gaza.**

The project will be implemented by the Palestinian Water Authority.

B. Project / Programme details (max. 8 pages)

B.1. Context and Baseline (max. 2 pages)

Acute water scarcity in Palestine is a strong determinant of the vulnerability of its population, in particular in rural areas. The Palestinian national adaptation plan and the initial national communication to the UNFCCC have identified water and food security as the most vulnerable issues in Palestine, with knock-on implications for all sectors. This is also highlighted in the National Determined Contribution (NDC).

The geopolitical situation substantially reduces the Palestinian's adaptive capacities, thereby compounding climate vulnerabilities to "manmade" constraints and limitations of access to the water resource, in particular in the Gaza Strip and in rural areas of the West Bank.

Palestine has one of the lowest *per capita* water availability in the world. The average domestic water consumption is only 72 liters per capita per day (l/c/d) in the West Bank and 96 l/c/d in the Gaza Strip, below the 100 l/c/d minimum recommended by the World Health Organization.

The impacts of climate change identified at regional level or in neighboring countries broadly apply to the Palestinian situation. Studies have attempted to model the impacts of climate change on Palestine's water resources: the regional climate model PRECIS (Providing Regional Climates for Impact Studies) and the IPCC A1B emissions scenario, predict a decrease in precipitations of 15% by mid-century and 23% by the end of the century, lowering per capita internal water resources in Palestine to 67 m³ (cubic meter) by 2050 compared to 190 m³ in 2010. The discharge of the Jordan River is projected to decrease by 22% by mid-century and 30% by the end of the century. Previous modelling studies suggest even larger impacts on the Jordan River: simulations using the GLOWA-Jordan River Regional Climate model coupled with the hydrological model WaSiM forecasts discharge reductions of up to 40% by 2070-2099 (Khatib 2009, cited in UNDP 2010). The Japanese Meteorological Agency Atmosphere General Circulation Model (JMA-AGCM) run for the eastern Mediterranean JMA-AGCM projects a 82-98% collapse in the Jordan River flow (at an unspecified location) by 2100 (Kitoh et al. 2008, cited in UNDP 2010).

Further, the UNDP's analysis of climate vulnerability in Palestine highlights climate risks as a humanitarian threat, placing the Palestinians within the policy realm of disaster risk management and emergency response operations. Current high levels of food and water insecurity in Gaza and the West Bank are forecast to be exacerbated by climate change, on account of worsening food growing conditions (the agricultural sector consumes over two-thirds of water abstracted or flowing from springs in Palestine) and a fragile water supply infrastructure. **Combining population growth forecasts and regional climate change projections, it has been estimated that Palestine will experience a water deficit of 271 Mm³(million cubic meters)a year by 2020.**

Increasing temperatures, due to climate change, also mean an increase in crop demand for water, as evapotranspiration (direct consequence of photosynthesis and plant growth) is an increasing function of temperature. In this context, productivity of irrigated agriculture is four to six times that of rain fed agriculture for most crops in the West Bank and Gaza Strip, yet this form of agriculture amounts to less than 25% of the total cultivated area. Access restrictions, water scarcity and population growth is leading to an increasing pressure on groundwater resources for irrigation, sometimes with irreversible consequences including quality deterioration.

In this context, making use of non-conventional water resources, such as Treated Wastewater (TWW) is considered a prerequisite for any sustainable development of irrigation in Palestine, thereby increasing the profitability and climate resilience of Palestinian agriculture.

In Palestine, 50 Mm³ of TWW is generated every year. If a fraction of this, for example 60% (i.e. 30 Mm³) met agricultural quality requirements and were used for irrigation, it would entail a 20% increase in water available for Palestinian farmers, enough to irrigate an additional 3 500 ha and create 15 000 jobs (*Source: FAO*). Whereas many other countries with dry conditions, are already making use of this resource for irrigation (up to 80% of the TWW can be reused), this potential has not yet been realized in Palestine, mostly due to insufficient infrastructure and capacities to effectively utilize TWW for irrigation.

Water and sanitation, drinking water and associated sewage networks and waste water treatment plants (WWTP)

projects, have multiplied over the years in Palestine, mainly through donor funding (KfW, WB, AFD being the main partners of the Palestinian government in this sector), but also by way of public funding. In Gaza, the North Gaza Emergency Sewage Treatment (NGEST) plant (funded by WB, AFD and the EU), in the outskirts of Gaza City, will be up and running early 2018 at a capacity of 36 500 m³/day (13.3 Mm³ per year). The NGEST plant will alleviate the pressure on the existing WWTP (Beit Lahia), functioning at six times its design capacity and will help solve the acute environmental and health hazards caused by the accumulation of waste water in Gaza.

In the baseline situation, non-treated waste water is currently stored in precarious basins outside of Gaza City (posing a threat to nearby populated areas) and transferred to infiltration basins, where it penetrates the aquifer resulting in severe pollution of the groundwater of high water table (rejection of these waters to sea is not an option, for environmental and geopolitical reasons), threatening the livelihoods and health of both rural and urban population when using this highly polluted water for agriculture and drinking.

The finalization of the NGEST plant offers the opportunity to increase water and food security in the Gaza strip by generating a “new” and non-conventional resource for agricultural purposes, by way of infiltration in the aquifer (after tertiary treatment), recovery of treated waste water (diluted in ground water then extracted by wells), and development of an efficient irrigation scheme downstream. Infiltration of treated waste water in the aquifer will both increase the quantity and the quality (depollution) of the groundwater, thereby increasing its availability and suitability for agricultural purposes and, by the same token, preventing massive contamination and subsequent proliferation of water-borne diseases within the population of Gaza city and its rural outskirts (an estimated 200 000 people would be affected positively by the project).

The cycle of production and reuse of TWW relies on an energy mix supplying the power for the functioning of the NGEST WWTP, the Recovery scheme (which involves pumping from the aquifer) and to pressurize the drip irrigation network at the end line. The current power concept consists of an external supply from the grid and on-site generation from emergency generators with sufficient capacity to cover the load of the facility (estimated at 9 MVA). The overall power supply situation in Gaza is constrained due to general geopolitical circumstances and options for extending existing supply via the distribution network are limited because of cost of fuel for the local power plant or due to difficulties in fuel availability, in particular the limitations to increase the supply from cross-border sources.

Consequently, the Palestinian Water Authority (PWA) seeks, together with other responsible stakeholders (in particular the Palestinian Energy and Natural Resources Authority, PENRA) to **identify the most viable, long-term sustainable power supply option for the NGEST facilities during its whole life-cycle.**

Closing the water cycle, by the reuse of treated water, calls for increased coordination between several stakeholders (the Palestinian Water Authority and the Ministry of Agriculture, as well as PENRA, and EQA based in Ramallah, and the farmers benefiting from the project). Close and careful monitoring of water quality of water used for irrigation or for recharge the aquifer will be guaranteed. Enforcing regulations for the use of the treated water and monitoring of the quality and quantity of water in the aquifer will be key challenges of the project.

B.2. Project / Programme description (max. 3 pages)

The project fits within the National Adaptation Plan (NAP) for Palestine, as well as its focus on the “water security – food security” nexus within Palestine’s Nationally Determined Contributions (NDS), as an adaptation action for the following “highly vulnerable” sectors: Agriculture/Irrigation Water/ Improve water-use efficiency and using alternatives water resources. It is also in line with the NDC’s objectives in terms of Energy for the Gaza Strip: “Use of renewable energy, such as solar, to reduce imported energy”.

Indeed, the project will generate a “new” water resource for agriculture and, as a co-benefit, depollute the aquifer used for both domestic and agricultural purposes in the Gaza Strip. It will target amongst the most vulnerable population in the sub-region, prone to political instability compounded with the effects of climate change on increasing aridity and overall water insecurity.

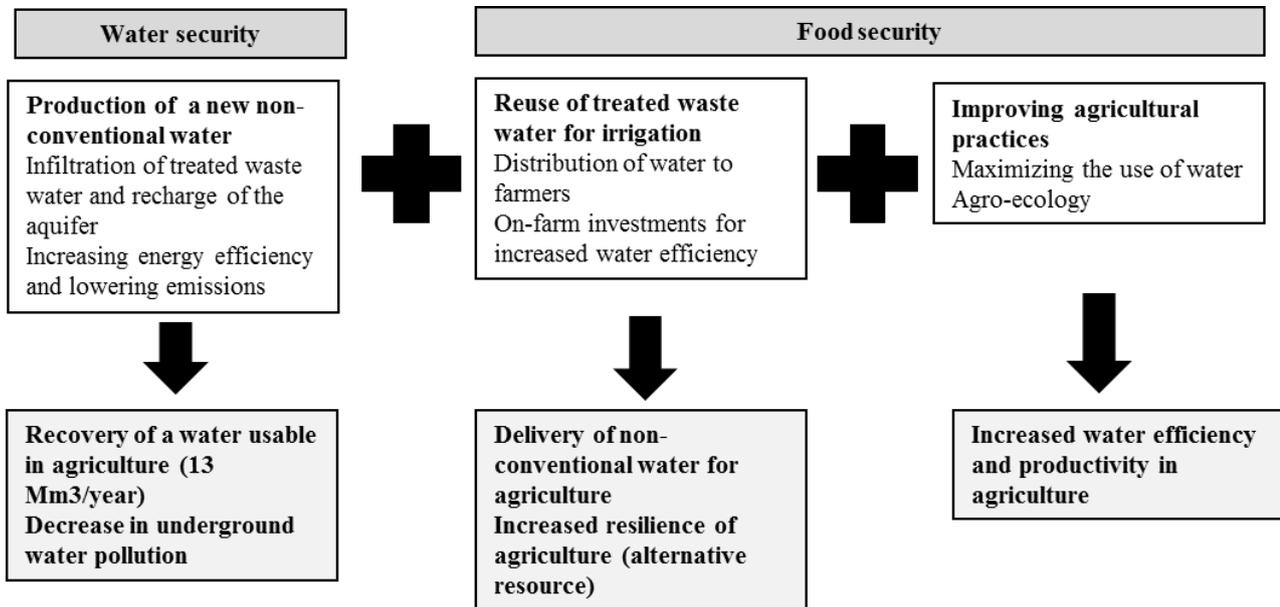
The project’s goal is to **develop an integrated and low-emission water management scheme capable of reducing the impact of increasing aridity due to climate change, by delivering water for sustaining agriculture and increasing the resilience of of highly vulnerable population in the Gaza Strip.**

The specific objectives of the project are as follows:

O1. Reduce the vulnerability of Gaza’s coastal aquifer and secure sustainability of access to drinking and agricultural water;

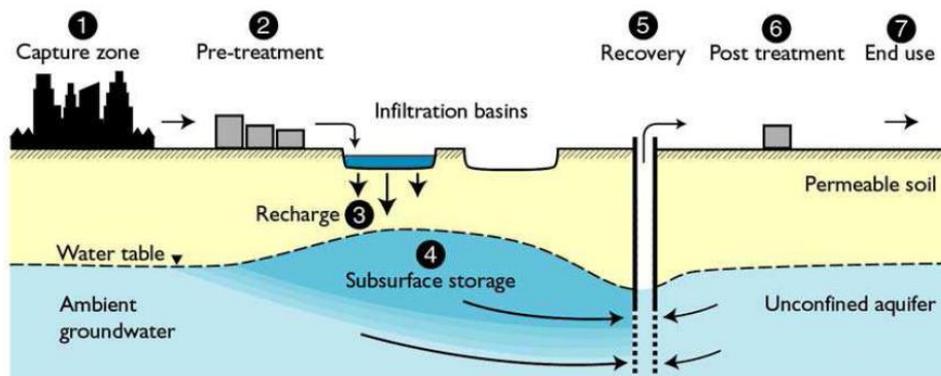
O2. Promote climate resilient and water-efficient agriculture;

O3. Enhance the institutional and operational capabilities for integrated and resilient water management.



Main outputs of the project are:

OUTPUT 1: Reducing Gaza’s vulnerability to climate change by delivering a “Treated Waste Water Reuse Scheme” based on (i) the rehabilitation of infiltration basins in the vicinity of the NGEST plant, in order to allow the vertical transfer and tertiary treatment (filtration by sandy soil) of treated waste water from the plant to the aquifer, in the amount of 36 500 m³/day ; (ii) the drilling of recovery wells (14) “downstream” from the NGEST plant in order to extract the corresponding volume, store it in a reservoir and make it available for agricultural purposes. The following schematic illustrates this well-known “infiltration – recovery” approach to reuse of treated waste water:



OUTPUT 2: Deliver a public irrigation scheme, based exclusively on drip irrigation, for the distribution of unconventional water to farmers over an area of 1 200 ha, including primary, secondary and tertiary (drip irrigation) distribution networks;

OUTPUT 3: Reducing GHG emissions by expanding the portfolio of on-site generation by a Photovoltaic system (5,1 MWp) in designated areas within the NGEST project to allow making the power supply more sustainable through the increase of emission-free and independent renewable energy (a co-generating facility is already in place, in order to produce energy from the organic solid waste generated by the plant);

OUTPUT 4: Support the Palestinian government and the PWA, in particular, in expanding its strategy for the reuse of waste water in other parts of Palestine, capitalizing and replicating the lessons learned from the programme.

The “Reuse Cycle” will rely on the production of 36 500 m³/day of treated waste water by the NGEST plant, and its transfer to nearby 1 200 ha of agricultural land. This represents about 10 000 m³/ha/year which is sufficient water for relatively intensive agricultural production using drip irrigation, **which will therefore be performed with minimal withdrawal from the aquifer.** This will benefit 1 000 vulnerable households in providing them with a secure source of

water for agriculture, in addition to providing them with a modern, water-efficient irrigation networks and appliances. The water filtered a first time to the aquifer through the infiltration basins and, a second time, by irrigation on agricultural land (minus the part evaporated) will further dilute the underground pollution and restore the quality of the aquifer used for agricultural and drinking purposes. It should therefore reduce the vulnerability and preserve the health of 200 000 people living in Gaza City and North Gaza governorate (50% of its population in the current estimation).

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). By adding the photovoltaic (PV) system to NGEST, the annual supply from the grid in 2018 is 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.**

Further, the project will include a “soft” component dedicated to reinforce the PWA as the coordinator of “Reuse actions”, in particular with the ministry of agriculture. Support to the PWA in the form of a technical assistance will ensure quality of works and of the monitoring of the aquifer in qualitative and quantitative terms. Broader support to the Palestinian government will be delivered in order to strengthen its strategy for the use of non-conventional water, namely for adaptation of agriculture to climate change. The proposed institutional framework envisages a joint management of the TWW reuse scheme between the PWA and the farmers, organized in a Water Users Association (WUA). The WUA will be supported by the government and the project, technically (the first five years) and financially (the first three years), and will be responsible for operation and maintenance of the irrigation network (the recovery scheme will remain under public management. A water tariff will be applied for access to TWW (~.33 USD/m³), which is calculated to cover 100 % of OPEX costs after the first three years (investment costs are covered by the government/donor agencies as grants, except for on-farm investments to be reimbursed by the farmers through the tariff over the first 3 years, when OPEX costs are covered by public funding).

The project’s components are as follows:

C1. Production of non-conventional water for resilient agricultural purposes

- Infiltrate (tertiary treatment and production of a water fit for agricultural production) and recover treated waste water coming from NGEST WWTP.

C2. Develop a low emission water-reuse system

Expand the portfolio of on-site generation of power by the introduction of a photovoltaic system

C3. Enhancing the resilience of local agriculture through an improved irrigation system

- Develop of a water-efficient irrigation network (drip irrigation) over 1 200 ha;
- Provide extension services to farmers, in order to promote water-efficient practices based on drip-irrigation technology.

C4. Improve the capacity of the Palestinian government, the PWA and the Water Users Association

- Enhance capacity of the NDA to follow-up and contribute to the implementation of the water component of the National Adaptation Plan;
- Support the PWA in upscaling the experience in other location in the West Bank;
- Build the capacity of the WUA, support operation and maintenance of the scheme,

C5. Project management

The project will be managed by the PWA, which will directly implement the recovery scheme downstream from the NGEST WWTP and coordinate with other line agencies for the irrigation/agriculture component (Ministry of Agriculture) and for the energy component (PENRA).

The PWA will also be in charge of implementing and monitoring the Environmental and Social Impacts Management

Plan.

Following the signature of the Paris Protocol between the PLO and Israel in 1995 (also called Oslo 2), the Palestinian Water Authority (PWA) was established by the Palestinian Authority as an independent public entity attached to the President of the PA. The PWA's mission is to manage, develop and protect water resources through integrated and sustainable water supply for citizens and ensure the protection of the environment and the achievement of the development goals for the Palestinian society.

PWA is one of AFD's more important partners in its cooperation and assistance programme with the PA. Since 1998, the water and sanitation sector has been a priority for AFD, representing up to half of its commitments for Palestine (a total of 130 M€ since 1998).

AFD's investments have supported PWA's strategies and include: improving access to drinking water, extension of sanitation networks, wastewater treatment plants, water resources management, developing the sector governance and ensuring sustainable development goals in the water sector.

In the context of increasing water scarcity, PWA launched a "treated wastewater reuse programme" mainly directed to the agricultural sector (representing ~80% of extracted fresh water). Several pilots have been implemented so far and the legal framework is fully developed with clear guidance and usage of TWW for agricultural purposes.

The Gaza Strip presents, in general, a comparatively high level of operational risk due to the geopolitical situation; its population presents nevertheless a high level of vulnerability, in environmental, social and economic terms, that is exacerbated by the effects of climate change, in particular on increasing aridity and scarcity of water resources.

In the particular case of the project, three specific risks can be identified at this stage:

- **Quality of the water in the aquifer and related health issues** (in the process of its use for agriculture or through drinking): a monitoring and management system will be put into place, following the recommendations of the ESIA, in order to closely follow the quality of the water exiting the WWTP and extracted from the aquifer with regard to the applicable thresholds for (i) infiltration of water in aquifers and (ii) reuse in agriculture;
- **Power needs of the WWTP+RS:** as mentioned above, in the baseline scenario, the system relies on a relatively insecure, and unsustainable, energy mix due to limited access to the grid and to diesel for the generators. This situation will be improved by introducing a PV system, minimizing the dependency on diesel and electricity from the grid;
- **Acceptance of TWW:** willingness to use and pay for TWW is usually an issue -due, among other things, to cultural considerations. The infiltration of the TWW in the aquifer and its dilution with the underground resource, as well as the quality management system in place, should strongly mitigate this risk.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

The following table summarizes the way the project will contribute to meeting the GCF's investment criteria:

<i>Paradigm-shift Objective</i>	<i>Expected result of the project</i>
Increased climate-resilient sustainable development	Develop an integrated and low-emission non-conventional water management scheme capable of reducing the impact of increasing aridity due to climate change, by delivering water in quality and quantity for sustaining agriculture and of vulnerable populations in the Gaza Strip. This will increase the resilience of half of the total population of Gaza City.
Fund-level Impacts	
Tonnes of carbon dioxide equivalent (t CO₂eq) reduced as a result of Fund-funded projects/ programmes Reduced emissions through increased low-emission energy access and power generation	71 000
Total Number of direct and indirect beneficiaries;	1 000 farmers benefiting from non-conventional water for agriculture; 1 000 households with improved income (5 000 people, 50% women)
Number of beneficiaries relative to total population	200 000 people protected from water pollution 50% of population of Gaza City
1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions 1.2 Number of males and females benefiting from the adoption of diversified, climate-resilient livelihood options (including fisheries, agriculture, tourism, etc.)	1 000 farmers (90% male at this stage; prior to a more in depth gender analysis)
2.0 Increased resilience of health and well-being, and food and water security 2.2 Number of food-secure households (in areas/periods at risk of climate change impacts)	1 000
2.3 Number of males and females with year-round access to reliable and safe water supply despite climate shocks and stresses	200 000 ; 50% women
3.0 Increased resilience of infrastructure and the built environment to climate change threats 3.1 Number and value of physical assets made more resilient to climate variability and change, considering human benefits	1 irrigation scheme, the economic and physical viability of which is dependent on water flow generated by TWW. Value = 15 MEUR
Project/Programme Outcomes	
Number of technologies and innovative solutions transferred or licensed to promote climate resilience as a result of Fund	1 infiltration and recovery scheme from aquifer (technology transfer from US and Israel)

support.	
5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development 5.1 Institutional and regulatory systems that improve incentives for climate resilience and their effective implementation.	Improved institutional and regulatory systems for REUSE and enhanced enabling environment.

C. Indicative financing / Cost information (max. 3 pages)

C.1. Financing by components (max ½ page)

Please provide an estimate of the total cost per component and disaggregate by source of financing.

Component	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
C1. Production of non-conventional water for agricultural purposes	20 000 000	15 000 000	Grant	5 000 000		AFD
C2. Enhancing the resilience of local agriculture through an improved irrigation system	19 000 000	14 500 000	Grant	4 500 000	Grant	AFD
C3. Improve the capacity of the PA and PWA	2 500 000	2 000 000	Grant	500 000		AFD
C4. Project management	1 000 000	500 000	Grant	500 000	Grant	AFD
Indicative total cost (USD)	42 500 000	32 000 000		10 500 000		

C.2. Justification of GCF funding request (max 1 page)

The water treatment facilities implemented within the NGEST project, to be completed in 2018, are the result of a long and coordinated effort of several donor agencies (since 2006), in partnership with the PWA. The complexity of the works related to the high capacity of the plant, the need to find alternative sources of energy (bio-digester) / (solar), but also the political and security situation in Gaza, explain this lengthy involvement. At this moment in time, the full extent of the NGEST plant (funded by World Bank, AFD and the European Commission) is nearly completed and a first batch of recovery wells and a reservoir are under implementation.

The remaining actions to convert this water treatment project into a full model of integrated management of water resources, by reuse of non-conventional water for agriculture, are not funded to date (additional 15 wells and reservoir, irrigation scheme, and a photovoltaic system are needed). To this end, AFD intends to direct the totality of its annual donation for Palestine to co-fund this project, in the amount of USD 10 500 000 covering only part of the 42 500 000 USD needed to complete this transition.

The incremental costs associated with this paradigm change, incur in the context of growing aridity due to climate change and correspond to the additional investments needed to produce, recover and store a high quality non-conventional water resource (in the amount of 13 Mm³/year), as well as those needed to transfer this resource to close-by areas of agricultural production (1 200 ha), and distribute it to farmers. Other incremental costs will be

incurred in order to **increase the energy efficiency and lower the emissions of the NGEST WWTP + Recovery Scheme** (NGEST + RS), by introducing a photovoltaic (PV) system.

Finally, the reuse of this “new” water resource in agriculture, and the *closing of the water cycle*, in order to enhance the resilience of farmers in Gaza to aridity and climate change impacts, implies hard and soft investments for development of water-efficient irrigation and, thereby increasing the productivity and income of highly vulnerable rural households in Northern Gaza.

In order to cover these incremental costs related to the shift in paradigm towards integrated water security and adaptation of agriculture to climate change, the support of the GCF is needed in the form of a grant, additional to the contribution by AFD. This level of concessionality is justified by the fact that the PA has no borrowing capacity, nor sufficient public funding to cover the costs of this project.

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

The project is implemented by the Palestinian Water Authority in the context of the Water Law, which calls for a joint management of public infrastructure between the Government and users.

The preferred scenario to ensure the sustainability of the project is organized 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 operation and management to the Water Users Association (WUA);

2. This would imply that:

- PWA would own the Recovery System, and operate it for the first 3 years of the project;
- 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 Recovery and Reuse systems;
- PWA would continue to own the systems but would lease them to the WUA.

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 .33 USD/m³).

C.4 Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

A pre-identification mission from the AE has been organized in July 2017 including a field visit to Gaza and meetings with the NDA (the Environment Quality Authority , EQA), which has confirmed its interest for the project and for its development into a funding proposal. Hereunder a relevant excerpt of the aide-mémoire of this mission:

“In this context, the production of non-conventional water and its reuse is one of the components of the PA’s NAP . As mentioned above, development of WWTPs and, in general the growing rate of harvesting of waste water presents an opportunity to consolidate REUSE investments in Palestine in order to close the “water cycle” ;

⇒ *This could take the form of a National REUSE Programme: Closing the Water Cycle for Adaptation of Agriculture to Climate Change, the first phase of which could batch together a set of projects in West Bank*

and Gaza, of similar maturity. AFD would be interested in co-funding its implementation and in presenting this programme to the Green Climate Fund in order to raise the necessary complementary financial resources.

⇒ *The mission has met with PWA, the Ministry of Agriculture and the EQA which have shown interest in moving forward along these lines. AFD will need official confirmation, namely from the EQA – GCF’s National Designated Agency- of the PA’s commitment to support the presentation of this programme to the GCF through the AFD.”*

Following this mission, follow-up meetings with the NDA have identified the project in Gaza as a high priority for the PA, with an urgent need for action. Further meetings have also allowed confirming AFD’s commitment to funding this project with the full amount of its annual support programme to Palestine for 2018.

The EQA will remain fully on-board, alongside the PWA, for the final steps of project preparation (mainly the elaboration of the Gender Assessment and Action Plan) and appraisal of this project, which is expected to take place during the second Quarter of 2018.

D. Supporting documents submitted (OPTIONAL)

- Map indicating the location of the project/programme
- Diagram of the theory of change
- Financial Model
- Pre-feasibility Study
- Evaluation Report of previous project

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes No

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes No