



External monitoring and ad hoc technical assistance to the SWIM Demonstration projects (phase II)

SWIM and H2020 Support Mechanism

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THE SWIM - H2020 SUPPORT MECHANISM PROJECT (2016-2019)

The SWIM-H2020 SM is a Regional Technical Support Program addressing the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, in order to ensure the coherence and effectiveness of Union financing or to foster regional co-operation, eligibility of specific actions will be extended to the Western Balkan countries (Albania, Bosnia Herzegovina and Montenegro), Turkey and Mauritania. The Program is funded by the European Neighborhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SWITCH-Med program, and the Clima South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MeSHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

The overall objective of the Program is to contribute to reduced marine pollution and a more sustainable use of scarce water resources. The Technical Assistance services are grouped in 6 work packages: WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3. Training activities, WP4. Communication and visibility, WP5. Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities.



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ABBREVIATIONS

ADA	Agricultural Development Association
ARIJ	Applied Research Institute Jerusalem
CMWU	Coastal Municipality Water Unit
DAC	Development Assistance Committee
EQA	Environmental Quality Authority
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Program
JWC	Joint Water Committee
MoA	Palestinian Ministry of Agriculture
MoH	Palestinian Ministry of Health
MoLG	Palestinian Ministry of Local Government
Mol	Palestinian Ministry of Interior
PARC	Palestinian Agricultural Development Association
PEDCAR	Palestinian Economic Council for Development and Reconstruction
PEF	Palestinian Environmental Friends Association
PSC	Project Steering Committee
PV	Photovoltaic System
PWA	Palestinian Water Authority
SWIM	Sustainable Water Integrated Management
TDS	Total Dissolved Solids
TWW	Treated Waste Water
WHO	World Health Organization



FOREWORD

The “*External monitoring and ad hoc technical assistance to the SWIM Demonstration projects*” (hereinafter referred to as the “Assignment”) aimed at providing: 1) a mid-term assessment for three Demo projects which have started their implementation in Palestine since February-April 2017; and 2) ad hoc assistance to the Demo projects involving capacity building and increasing their visibility. The three SWIM Demo projects (Phase II) stemmed from a regional call of proposals, their budget ranges between 1.3 -2.8 mil € and they are expected to finish in the year 2020 (i.e. duration 36 months). The projects are related to small scale wastewater treatment plants linked with treated wastewater reuse in agriculture and concluded recently their inception phases.

Specifically, the three (3) monitored Demo projects are:

1. «Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip», Coordinator: OXFAM;
2. «Promote wastewater treatment and reuse in the water scarce areas of the Middle East & North Africa through development and demonstration of innovative instruments and inclusive management plants», implemented by the Applied Research Institute- (ARIJ);
3. «Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank» – Palestine, Coordinator: Agricultural Development Association (PARC).

The project’s activities started in February and March 2017 and their first annual reports were concluded within the period of April to June 2018. As such, their assessment, (is a mid-term assessment), based on the inception report (application) and the reports submitted during the first year by each project.

Specifically, the objectives of mid-term assessment were: (1) to perform an external monitoring for each one of the three SWIM Demo projects (phase II); (2) to provide recommendations with regards to how the overall design and/or implementation of the Demo projects could be improved to better achieve their objectives (measures are proposed to enhance positive effects, to eliminate/mitigate/compensate undesired effects); (3) to provide the Operational Manager (OM) in the EU Delegation of the beneficiary country (Palestine), the DEMO project partners and other stakeholders with a framework that will enable an organised flow of information that serves management of the Demo project, accountability and learning purposes;

According to the Assignments’ Terms of Reference (ToR), the required output is a Monitoring Report for each SWIM Demo project (phase II) outlining the findings and concrete recommendations on the following:

- **Relevance** of the Demo projects to SWIM-H2020 SM objectives and main aspects, the beneficiaries’ requirements, country needs, global / regional priorities and partners’ and donors’ policies;
- **Effectiveness** of the Demo projects establishing to what extent project objectives were met by the interventions;



- **Efficiency** of the Demo projects establishing how resources/inputs (funds, expertise, time, etc.) have been converted into outputs / results;
- **Sustainability** of the results, including the contribution to capacity development as well as examination of whether adequate enabling conditions are in place in order to enhance **potential impact** of projects' activities;

In addition, the report will also include the provided *ad hoc* assistance to the Demo projects.

It should be noted, that the monitoring process focused more on identifying the relevance and enabling conditions for sustainability and impact and on an early look at efficiency and effectiveness aspects.

The monitoring also contains important provisions for success, eventual lessons learned and provides recommendations that project partners and stakeholders might use to improve the design and implementation of the project or other related projects and programs.

The assignment lasted 4-months starting from 04 September 2018.

The present Monitoring Report is submitted in accordance with the provisions of the ToR is structured in seven (7) sections:

- Section 0: Background Information
- Section 1: Description of the Demo Projects
- Section 2: Evaluation method and main methodological findings
- Section 3: Findings by evaluation criterion
- Section 4: Conclusions, lessons learned and recommendations
- Section 5: Ad hoc assistance to the Demo projects
- Section 6: Annexes
- Section 7: References



EXECUTIVE SUMMARY

The *External monitoring and ad hoc technical assistance to the SWIM Demonstration projects (phase II)* was carried out in the period September – December 2018 with the purpose to monitor and assess three Demonstration (Demo) projects in Palestine related to small scale wastewater treatment plants, linked with treated wastewater reuse in agriculture and to provide *ad hoc* assistance to Demo projects in terms of capacity building and enhancement of their visibility.

The overall objective of the three Demo Projects is to contribute to more sustainable water and environment management practices in Palestine, which is directly linked to the SWIM-H2020 SM's objective ***“to contribute to reduced marine pollution and a more sustainable use of scarce water resources in the ENP South Countries”***.

The specific objective of the Demo Projects is to identify, test, and disseminate “innovative solutions” that have the potential to be scaled up to bring a positive contribution to sustainable water management and tackling water pollution generated by municipal waste, urban waste water and industrial emissions in the target countries¹. In this sense, replicability for other partner countries with conditions similar to those of Palestine is among the objectives of the DEMO projects.

The scope of work of Demo projects is also linked to the SWIM-H2020 SM themes and more specifically with SWIM's theme Sustainable options and interventions, as well as with the SWIM-H2020 horizontal ones concerning capacity building and stakeholder engagement and finally with the cross-cutting themes related to urban wastewater and adaptation to climate change.

Specifically, the three (3) Demo projects monitored are:

1. «Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip», Coordinator: OXFAM;
2. «Promote wastewater treatment and reuse in the water scarce areas of the Middle East & North Africa through development and demonstration of innovative instruments and inclusive management plants», implemented by the Applied Research Institute- (ARIJ);
3. «Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank» – Palestine, Coordinator: Agricultural Development Association (PARC).

The assessment aimed at examining to which extent the implementation of the three Demo projects has contributed to the above mentioned objective.

The findings and recommendations are structured according to the DAC **evaluation criteria**: relevance, effectiveness, efficiency, impact and sustainability. Specific **recommendations** are also made with regard to how the overall design and/or implementation of the Demo projects could be improved to better

¹ EC, “Sustainable Water Integrated Management programme (SWIM)– Phase II Demonstration projects - Guidelines for grant applicants”, Budget line(s): BGUE-B2015-21.030102, Reference: EuropeAid/150950/DH/ACT/Multi



achieve their objectives (measures are proposed to enhance positive effects, to eliminate/mitigate/compensate undesired effects).

The main beneficiaries of the present report are the Operational Manager (OM) in the EU Delegation of the beneficiary country (Palestine), the DEMO project partners and other stakeholders.

The methodology developed for carrying out the evaluation used quantitative and qualitative methods as complementary instruments, with respect to specific questions seeking to better understand the three Demos management and implementation processes, and the stakeholders' involvement and perspectives.

The desk research was performed through a rigorous review of strategic documents, programming documents and projects' documentation.

The objective of the evaluation method was to determine clear links between input-output-result and tangible effects, which were further analysed in the analysis of contribution and impacts. This is why, the evaluation considered mostly the output/results that have direct effects.

During the field research the evaluation team held interviews with representatives from the implementing partners, target beneficiaries and other stakeholders. By combining both quantitative and qualitative data and using different types of research methods, the results were triangulated, assuring in that way their higher accuracy and validity.

The conclusions, lessons learned and recommendations from the monitoring work are as follows:

Conclusions

- The analysis of the intervention logic of all three-Demo projects and the desk review, illustrate that the projects contributed to the respective objectives of the strategic and programming documents.
- The main objective of contributing to reduced marine pollution and a more sustainable use of scarce water resources in Palestine is met. In addition, all three Demo projects address the issue concerning capacity building and stakeholder engagement.
- There is a positive correlation between planned and actual activities of the projects, which generally contribute to the objectives of the strategies.
- All projects face delays and difficulties but in the end it seems that they will manage to overcome them. It is important to stress out that these difficulties could be attributed, to some extent, to the call for proposals itself, but nonetheless the following elements were also observed: lack of prior consultations with local communities and other stakeholders, improper selection of site, underestimated budgets, lack of local support, lack of provisions of operation and therefore problems in sustainability and continuity. Complementary to the aforementioned, the following elements should be highlighted:
 - Demo 1- Oxfam:
 - Design problem due to the non-realization of a thorough prior consultation and prior risk analysis at the initial design phase: The Action's targeted location had to move from Al Shouka to Al Mawasi due to the lobbying efforts against the Action by four major large-scale and influential Al Shouka farmers who completely rejected TWW usage for



agricultural irrigation. This development could be also perceived as an indication of lack of knowledge on the region's local dynamics.

- Demo 2-ARIJ:
 - Non effective planning due to the non-realization of prior risk analysis at the design phase: There are actions, such as: a) sludge dewatering excavations and civil works, b) compost facility land preparation and civil/mechanical works, c) operation of sludge dewatering and compost facility, which are being implemented with some shift from what was set in the project's original action plan, mainly resulted from the unexpected faced land parcels procurement.
- Demo 3-PARC:
 - Design problem in terms of the project budget due to the non-realization of prior consultation, prior risk analysis at the design phase: When the project was accepted by the EU, a 20% of the projects budget was assigned as financial community contribution. This seems to be high and difficult for the community to afford. In addition, as no risk analysis study was carried out before the start of the project, then it is expected that when the WWT unit and the sewage pipelines network are constructed, then the project will be under risk. This risk is composed of two components: 1- not available funds to connect houses to the sewage network; 2- no estimation or calculation of the operating cost and cost of TWW and hence no budget was allocated from anywhere for the running cost of the project.
- All Demo projects are anticipated to have a positive impact to the local communities after their full implementation and enhance the effectiveness of local water resources governance.
- There is no documented defined phase-out strategy for the demo projects.
- The evaluation identified several good practices worth taking on board for the future programming, but also some opportunities for enhancing/maximising the projects' results through identification of risks beforehand and elaboration of a thorough action plan for addressing the potential risks and improving design and implementation of the interventions.
- Regarding the quality of the call for proposals for grants, it is generally very positive, although there is room for improvement. The global and specific objectives could be further linked to the expected results.
- Focus should be given on the intended change and have a clear vertical logic. The clarity of the objectives is not just a matter of formulation. Clearer objectives would bring more focused activities and would allow for better monitoring and evaluation of the expected results. Moreover, projects' design should include clear and realistic indicators of achievement.

Lessons learnt

- There are opportunities for improvement in terms of designing more targeted interventions in consideration of the sectors' needs and the target groups.
- There is an inherent problem: A thorough risk analysis should be requested if not at the proposal phase, at least at the very beginning of the projects. In some cases, it might be useful even at a later stage.



- Technical challenges or innovations dominate the core of the projects. Emphasis should be given on arrangements for financing and achieving sustainability of the projects, so that a up-scaling is fostered in areas with similar conditions.
- Social acceptance of a project cannot be 100% guaranteed, despite good relationships with the community members and key influencers. There needs to be consistent efforts for awareness raising, implemented since the very beginning of the project, including through education interventions at schools.
- Further to the above point, engagement of stakeholders is essential, should the projects seek to serve as models for future projects, thus promoting scalability. Therefore stakeholders analysis is highly recommended for all projects.
- Outputs and deliverables are intended to serve the needs of the beneficiaries. It is therefore, important that beneficiaries profit from their implementation on learning how to do the right things in a better way. To this end, the pilot projects should focus more on promoting the capacity building of local institutions and spread modern techniques and methodologies on the topics addressed by the initiatives, etc. These are important results that should be ultimately requested at the very end from the three demo projects, currently being monitored.
- It is too early, however, to assess if the projects are able to achieve the above mentioned . Maybe, some or all fail partially in some aspects of the outputs that are supposed to deliver. However, if they manage to serve the purpose said they should be considered as successful.

Last, it is interesting to note that all Demo partners declare that there are not practical actions that could have been implemented differently, in a better way and, perhaps, more efficient. By this statement, they might actually imply that: a) working in a very complex environment, they did not do something wrong; b) all adjustments, modifications, changes to the context of the projects were due to external factors. So to cope with this, at the closure of the projects, all partners should be requested to provide recommendations on how they would have drafted differently the call that guided the drafting and design of their work plan, which at certain points had to be revised.

Main Recommendations

RECOMMENDATION 1	Enhance the scope of the call for proposals, increased focus on specific target groups and type of activities, and where appropriate introducing a territorial dimension.
RECOMMENDATION 2	Provide for a greater participation of the private sector a) to attract capital investment; b) to improve technical and managerial efficiency, promoting the idea of having as an integrated part of the governance of the projects, private sector involvement.
RECOMMENDATION 3	Support the implementation of similar projects of larger scale, through wide-range grant schemes, including also support to increasing employment opportunities.



RECOMMENDATION 4	Perform Risk Analysis at the beginning of all projects; monitor and update regularly the analysis results.
RECOMMENDATION 5	Improve project planning and coordination mechanisms and introduce/strengthen partner consultations from the project preparation phase.
RECOMMENDATION 6	Strengthen cross-sectoral / projects fertilization and complementarity among sectors / projects.
RECOMMENDATION 7	Include a cash for work element on TWW interventions. This approach encourages trade and creates secondary economic benefits. It also allows people greater choice and control over how they will rebuild their lives, thus helping to restore their dignity as well as their livelihoods.
RECOMMENDATION 8	Employ labour force from the areas of interventions, thus enforcing local employment, boosting local economy and enhancing acceptance of the projects
RECOMMENDATION 9	Increase the sense of community ownership of the three projects.
RECOMMENDATION 10	Engage stakeholders, insist on awareness raising and education actions, since the very beginning of the projects.

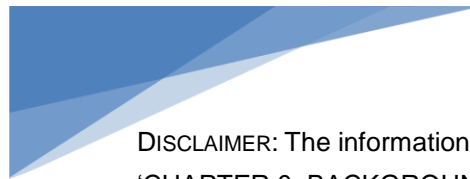


0. BACKGROUND INFORMATION

0.1 GENERAL FRAMEWORK FOR FUNDING THE DEMO PROJECTS

0.1.1 General

The SWIM (Sustainable Integrated Water Management) programme, funded by the European Neighbourhood and Partnership Instrument (ENPI) started in 2010. It comprised a Supporting Mechanism (service contract) and a set of 5 Demonstration projects (grants awarded following a call for proposals). The SWIM programme targets Mediterranean countries covered by the European Neighbourhood Policy: Morocco, Algeria, Tunisia, Libya, Egypt, Palestine², Israel, Jordan, Lebanon, and Syria³.



DISCLAIMER: The information included in 'CHAPTER 0: BACKGROUND INFORMATION' reflects a desk study based on data provided by Palestinian sources, and complimented by interviews and information provided during the site visits"

In August 2014, the European Union approved a follow up programme (the SWIM II programme). It set aside €15 million, with €3 million for a Supporting Mechanism and €12 million for Demonstration Projects.. SWIM II will target the same countries as SWIM I.

The **specific objective of the SWIM II programme** is to strengthen integrated water resource management, with a special focus on water co-operation (including specific actions for shared water resources in the Maghreb), river basin management, water demand management, the water / energy / food security nexus, broad stakeholder participation and open access to data. The programme also addresses the reduction and prevention of pollution resulting from poor management of municipal waste, urban waste water and industrial emissions, as many of the pollutants end up in surface and underground water. The SWIM programme will therefore also contribute to achieving the objectives of the Horizon 2020 initiative and the commitments of Barcelona Convention, i.e., to substantially reduce the land-based sources of marine pollution in the Mediterranean.

Following a call for proposal launched in 2016, 3 projects have been selected:

1. «Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip», Coordinator: OXFAM (Gaza Strip);

² This designation shall not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue

³ The EU has suspended direct cooperation with the Syrian authorities since 2011, until further notice



2. «Promote wastewater treatment and reuse in the water scarce areas of the Middle East & North Africa through development and demonstration of innovative instruments and inclusive management plants», implemented by the Applied Research Institute- Jerusalem (ARIJ) (Jerusalem);
3. «Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank» – Palestine, Coordinator: Agricultural Development Association (Ramallah).

Those 3 projects will be monitored in the framework of this activity.

0.1.2 External monitoring of Demo projects

As stated in the project's ToR, SWIM H2020 SM is to provide external monitoring of Demo projects, and technical ad hoc assistance to the SWIM Demonstration projects. However, as Demo project activities started in February and March 2017, and their first annual report was expected between April to June 2018, it has been considered that the time available was very limited to conduct the Demo needs assessment and provide technical assistance to cover the identified needs. Therefore, the alternative action that was suggested by the SWIM H2020 SM project team was to provide ad hoc assistance by enhancing the Demo project actors' capacity and visibility.

The capacity building to be provided by SWIM H2020 is mainly in the form of offering ad hoc support in identifying opportunities for the Demo projects participation in the SWIM H2020 SM training events. As far as visibility issues are concerned, SWIM H2020 SM will be promoting their objectives, work and results.

It is planned that both Demo projects implementing partners and target beneficiaries will be invited to the SWIM H2020 regional events relevant to their scope of work and be trained. Furthermore, it is expected that during these events, the representatives of the DEMO projects' and their target beneficiaries will also from their side, share their knowledge, practical experiences and encountered problems in the application of their work in small scale, with the rest of SWIM H2020 SM event participants who are involved in projects of a larger scale, aiming for cross-fertilization.

Regarding the enhancement of their visibility, SWIM H2020 will be a dynamic platform for the Demo projects to present their objectives, work and results in the regional or sub-regional audience. of these events.

0.1.3 Demo projects under monitoring

The overall objective of the three Demo projects is to contribute to more sustainable water and environment management practices, which is directly linked to the SWIM-H2020 SM's objective "to contribute to reduced marine pollution and a more sustainable use of scarce water resources in the ENP South Countries".



The scope of work of Demo projects is also linked to the SWIM-H2020 SM themes and more specifically with SWIM's theme Sustainable options and interventions, as well as with the SWIM-H2020 horizontal ones concerning capacity building and stakeholder engagement and finally with the cross-cutting themes related to urban wastewater and adaptation to climate change.

During a skype conference call held between the project team and Mr. João ANSELMO, Programme Manager – Agriculture and Environment, the Office of the European Union Representative (West Bank & Gaza Strip, UNRWA), it was established (and later on confirmed by DG NEAR) that there are only three Demo projects which have started their implementation in Palestine since February-April 2017. These stemmed from a regional call of proposals, their budget ranges between 1,3 -2,8 mil € and they are expected to finish in the year 2020 (i.e. duration 36 months). The projects are related to small scale wastewater treatment plants linked with treated wastewater reuse in agriculture and concluded recently their inception phases.

Specifically, the three (3) Demo projects to be monitored are those mentions in the point 0.1.1, namely

1. **«Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip»**, Coordinator: OXFAM (Gaza Strip);
2. **«Promote wastewater treatment and reuse in the water scarce areas of the Middle East & North Africa through development and demonstration of innovative instruments and inclusive management plants»**, implemented by the Applied Research Institute- Jerusalem (ARIJ) (Jerusalem);
3. **«Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank»** – Palestine, Coordinator: Agricultural Development Association (Ramallah).

The demo project activities started in February and March 2017 and their first annual reports were delivered in June 2018. Given that SWIM-H2020 project ends in April 2019, there is not enough time for their final assessment, after their closure. Therefore, in view of the necessary annual monitoring to be provided by the SWIM H2020 SM, it was agreed that for the monitoring process SWIM H2020 would provide a mid-term assessment, based on the inception report and the reports submitted during the first year by each project.

0.1.4 Objectives and priority issues of Demo Projects

The objectives and priority issues of the above mentioned call for proposals under which the Demo projects were selected for funding are given below.

The **overall objective** of the call for proposals was to contribute to more sustainable water and environment management practices in the target countries.

The **specific objective (s)** of the call for proposals is to identify, test, and disseminate “innovative solutions” that have the potential to be scaled up to bring a positive contribution to sustainable water management and tackling water pollution generated by municipal waste, urban waste water and industrial emissions in the target countries.

Projects on “innovative solutions” are defined as follows:



- a. Projects that apply a technology, action, methodology or approach that has not been applied or tested before on a large scale; that offer potential advantages compared to current best practice; and that could subsequently be applied on a larger scale to similar situations, **or**
- b. Projects that put into practice, test, evaluate and disseminate a technology, action, methodology or approach that is new or unknown in the specific context of the beneficiary country, such as the geographical, ecological, socio-economic context; and that could subsequently be applied elsewhere in similar circumstances.

Priorities:

- I. Enhancing **effectiveness of local water resources governance**;
- II. Adapting and enhancing resilience to the water-related **impacts of climate change**;
- III. Promoting **water demand management, water efficiency and non-conventional water resources (in particular recycled and reclaimed water), and protecting water quality and the good ecological status of water bodies**;⁴
- IV. Optimising **water financing and related instruments, with emphasis on innovative mechanisms at local level**;
- V. Improving the **management of municipal waste, urban wastewater, and/or industrial emissions** in order to minimize or prevent the **release of pollutants in water bodies**.

Each Demo Project directly targets at least one of the above priorities and can cover several of these priorities.

Every Demo Project has to fully address all of the following **methodological elements**:

1. Addressing a clearly identified priority problem, through an innovative solution (see definition above) that present interesting potential for replication and positive impact on water management and pollution prevention / reduction in the target countries.
2. Beyond the impact on water management and/or pollution reduction, the applications should to the maximum possible extent address one or several of the following added-value items: creating job opportunities (especially for youth), making companies more competitive, increasing water efficiency, enhancing resilience to climate change, stimulating the local economy and promoting the sustainable use of local resources;
3. Having a clearly demonstrated and measurable direct impact at local level – without excluding Actions with a national scope. The direct involvement of local stakeholders is compulsory;
4. Long-term sustainability, at institutional, technical, environmental and financial levels must be addressed at all stages, from action design to implementation and after project completion;⁵
5. Presence of a strong internal monitoring component, with dedicated resources and suitable indicators, in each action, so that results and impacts can be documented and disseminated in the most objective manner.

⁴ The definition of ecological status takes into account specific aspects of the biological quality elements, for example “composition and abundance of aquatic flora” or “composition, abundance and age structure of fish fauna”.

⁵ It is obligatory that throughout the duration of the project, the beneficiaries consider how these investments will be secured, maintained, developed and made use of or replicated after the end of the project. This should be built into the proposal.



6. Active Dissemination activities: Action outcomes and lessons learnt will be presented and discussed in a regional (= multi-country) meeting and a user-friendly dissemination product will have to be made available at the end of the project; These are different from ordinary communication actions: replicability and transferability go beyond communication actions; they concern activities and approaches, integrated in all relevant project actions, which aim to facilitate the replication and/or transfer of the project's results and experiences beyond the project, including in other sectors, entities, regions or countries.
7. The Action must be consistent with EU policies in the field of water management, as well as with the needs of the country where the Action is to take place.
8. During the preparation of the proposals prospective applicants should look for synergies with ongoing water related programmes in the beneficiary country(/ies);

0.2 BRIEF WATER RESOURCES BACKGROUND IN PALESTINE

0.2.1 Water resources in Palestine

The large variations in rainfall and limited surface resources have led to **widespread scarcity of the fresh water resources** in the region, resulting in a heavy reliance on groundwater as the major source for various uses. The contribution of surface water to the overall water balance is limited and marginal.

In particular, all surface and ground water resources in Palestine are shared with Israel and/or other states. Surface water is scarce, and includes the Jordan River and a number of wadis (stream beds or ravines where water only flows seasonally and temporarily, often as flash floods after thunderstorms). The Jordan River is the only watercourse that can be used as a year-round source of surface water for the West Bank. It is currently controlled by Israel. Groundwater is the major source of freshwater supply for Palestinians (represents 95% of Palestinian water supply).

There are four groundwater aquifer basins in Palestine, which are located either partially or totally in the West Bank and Gaza Strip. Each of these basins can be divided into sub-aquifer basins.

0.2.2 Surface Water Resources

The **Jordan River** is shared between Israel, Lebanon, Syria, Jordan and Palestine. However, since 1967, Israel has prevented Palestinians from accessing this water source. The river originates on the slopes of Mount Hermon in Lebanon and flows southwards through Lake Tiberias for a total of 223 km until it spills into the Dead Sea, at approximately 425 metres below sea level. The Jordan River surface catchment area is about 18.300 km² (Map 0-2)⁶

⁶ <https://water.fanack.com/palestine/water-resources> - Accessed on 28/09/2018



The historical flow of the Jordan River was around 1.400 MCM/yr ⁷. However, the river's natural flow has been drastically altered following the construction of a series of dams and diversion projects along the river and its tributaries in Israel, Jordan and Syria. Israel diverts around 400 MCM/yr from Lake Tiberias. Most of this water is transported through the National Water Carrier for use along Israel's densely populated Coastal Plain and in the Negev. Syria has also built a series of dams on the main tributary of the Jordan River. As a result, the flow of the Lower Jordan River has dropped dramatically to between 20 and 200 MCM/yr and the water quality has sharply deteriorated⁸. Israel enjoys the biggest share of the Jordan River's water.

Map 0-1: The Jordan River Basin. Source: Fanack after ARIJ.



⁷ Millions of Cubic Meters per year

⁸ UN-ESCWA & BGR (United Nations Economic and Social Committee for Western Asia and Bundesanstalt für Geowissenschaften und Rohstoffe), *Inventory of Shared Water Resources in Western Asia*, Beirut, 2013, pp. 177-200, 2013

0.2.3 Groundwater Resources

0.2.3.1 West Bank

The main water resource for Palestinians in the West Bank is the **Mountain Aquifer**. This groundwater resource lies under both Palestine and Israel. It is 130 km long and some 35 km wide, fed mainly by rainwater falling over the mountains of the West Bank (Map 0-3).

Map 0-2: The Mountain Aquifer and the Coastal Aquifer. Source: Fanack after UNEP, 2002.



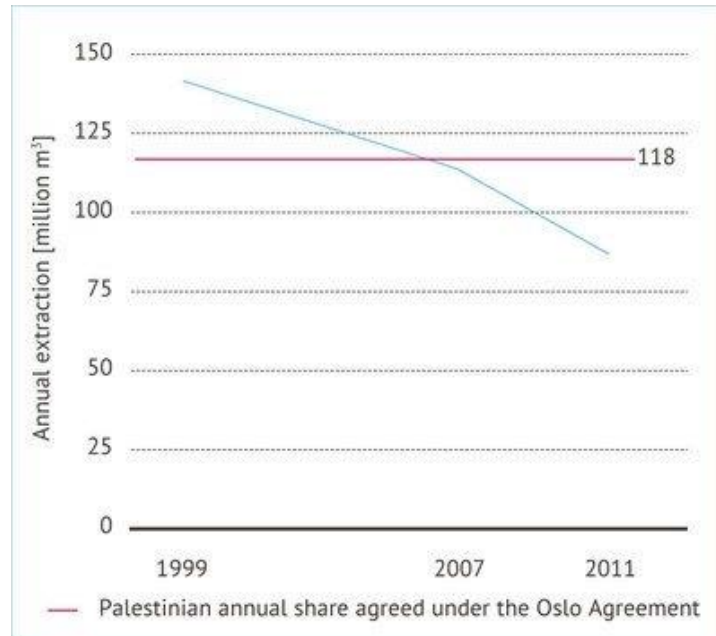
With a total average yield of 679-734 MCM/yr, the Mountain Aquifer is divided into three parts: the Western Aquifer Basin, North-Eastern Basin and Eastern Aquifer Basin. It is a very important resource for both Israelis and Palestinians. It contributes about 25% of Israel's total water budget⁹. Israel extracts about 80% of the Mountain Aquifer's potential yield, and restricts Palestinians to only about 20% of its estimated potential.

Palestine's share of the Mountain Aquifer's resources has declined over the last 15 years because of several reasons (ie reduced natural recharge restrictions on well drilling etc). In 1999, for example, overall Palestinian water extraction from the Mountain Aquifer was 138 MCM, dropping to 113 MCM in

⁹ Amnesty International, *Troubled Waters – Palestinians Denied Fair Access To Water*, 2009. Available at: <http://www.amnestyusa.org/pdf/mde150272009en.pdf>, accessed 1 October 2018

2007 and 87 MCM in 2011, which is less than the 118 MCM/yr that was allocated to Palestinians in the 1996 Oslo agreement (Fig. 0-2)^{10 11 12}.

Figure 0-1: Annual extraction from the Mountain Aquifer during the period 1999 – 2011 in million cubic metres. Source: Fanack after World Bank, 2009.



0.2.3.2 Gaza

Gaza's only source of fresh water is the Coastal Aquifer, a groundwater basin that runs the length of the Gaza Strip and along part of the Israeli coast (Map 0-2).

Its average recharge is estimated at up to 450MCM/yr in Israel and 55-60MCM/yr in Gaza. However, current extraction rates in Gaza reach up to 200MCM/yr, nearly four times as much as the aquifer can sustainably recharge each year to meet the growing demand of Gaza's population¹³.

The over-exploitation of the Coastal Aquifer and the absence of adequate sewage treatment facilities in the Gaza Strip have resulted in the deterioration of water quality in Gaza. It is estimated that 90-95% of Gaza's water is unfit for human consumption due to pollution¹⁴.

¹⁰ Richard, *Water resource allocations in the occupied Palestinian territory: Responding to Israeli claims*. Position paper from Applied Research Institute Jerusalem, June 2012.

¹¹ World Bank, *West Bank and Gaza Assessment of Restrictions on Palestinian Water Sector Development*, April 2009. Available at: <http://siteresources.worldbank.org/>, accessed 1 October 2018.

¹² PWA, 2012c. *National Water Strategy for Palestine, Toward Building a Palestinian State from a Water Perspective*, Draft Copy, 2012. Available at: <https://www.humanitarianresponse.info/system/files/documents/files/PWA%20-%20National%20Water%20Strategy.pdf>, accessed 1 October 2018

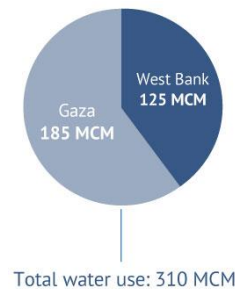
¹³ PWA, 2014a. *Gaza Water Resources Status Report, 2013/2014*, December 2014

¹⁴ PWA, 2011a. *The Gaza Emergency Technical Assistance Programme (GETAP) on Water Supply to the Gaza Strip Component 1 – The Comparative Study of Options for an Additional Supply of Water for the Gaza Strip (CSO-G), The Updated Final Report [Report 7 of the CSO-G]*, 31 July 2011. Available at: <http://www.humanitarianresponse.info/system/files/documents/files/PWA%20-%20CSO-G%20updated%20Final.pdf>, accessed 1 October 2018

0.3 WATER USE IN PALESTINE

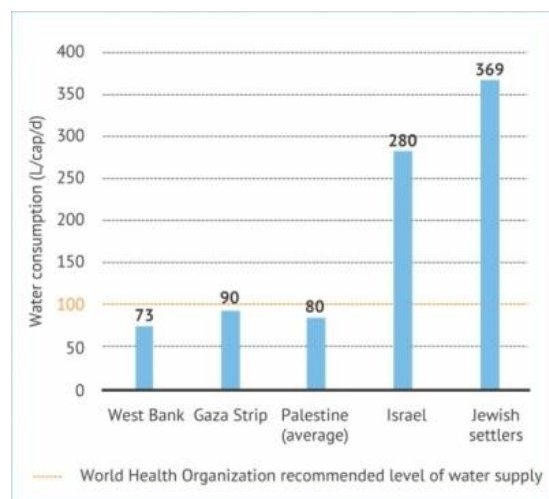
¹⁵In 2014, the total Palestinian water use was about 310 MCM for a population of 4,6 million. Of this, about 125 MCM was used in the West Bank and 185 MCM in Gaza¹⁶. During the period 2010-2015, around 55 MCM/yr of this total supply was purchased from Mekorot (Fig. 0-3).

Figure 0-2: Annual water use in Palestine in million cubic metres. Source: PWA, 2014



It is estimated that around a third of the water supply is lost in leakages due to old and inefficient networks. The infrastructure cannot be readily replaced or modernized, because of various obstacles. These obstacles include the requirement that permits be obtained for even small development projects from the Joint Water Committee (JWC) and Civil Administration (CA), and the significant financial investments necessary.

Figure 0-3: Water use in Israel and Palestine (L/c/d). Source: Amnesty International, 2009.



In practice, Palestinians have access to an average of no more than 60-90 litres per person per day (L/p/d), and some survive on as little as 10-20 L/d in communities located in rural areas or Area C. This is substantially lower than the WHO minimum standard of 100 L/d (Fig. 0-4)¹⁷.

0.3.1 Domestic Water Use in the West Bank

Most of the West Bank governorates suffer from severe water shortages. In 2011, around 88 MCM of water was supplied to the Palestinian communities for domestic use. Of this, approximately 53% was purchased from Mekorot, while the water quantities supplied from local resources reached almost 42

¹⁵ <https://water.fanack.com/palestine/water-use>, Accessed on 1 October 2018

¹⁶ PWA, 2014c. *Final Water Sector Policy and Strategy*, 2014

¹⁷ Amnesty International, 2009. *Troubled Waters – Palestinians Denied Fair Access To Water*



MCM. In 2011, the total real deficit in domestic water supply reached 62.4 MCM for the whole of the West Bank. On average, domestic water supply covered only 73% of the demand.

Currently, Palestinians have an intermittent supply, and over 25% of their homes are not even connected to the municipal network.

In 2009, water consumption by West Bank Palestinians was approximately 73 L/p/d (for some rural locations, this can be as low as 10-20 L/p/d).

Moreover, many residents of neighbourhoods and villages that are connected to the municipal network receive water only one day a week or only once every few weeks. This leaves them no choice but to buy more expensive and lower quality water from private suppliers who use mobile water tankers.

0.3.2 Domestic Water Use in the Gaza Strip

In the Gaza Strip, where there is a greater water supply in theory, the majority of wells (80%) only work partially and the rest not at all. In 2006, almost half of Gazan households bought their water, either bottled or from tanker trucks, because tap water was too salty to drink. Daily consumption is approximately 90 litres per person (2013/2014). Moreover, the quality of water delivered by the municipality exceeds maximum standards for contaminants and is largely unfit for human consumption (as described in Water Quality – Gaza). In 2014, system losses were estimated at 46%, and supplies are unreliable as power cuts and electricity shortages also prevent the processing and pumping of domestic water supplies¹⁸.

As tap water is salty and polluted, most Gazans depend on private vendors for their drinking water. This water comes from over 40 privately owned and operated desalination plants that have started up over the past few years to meet increasing demand. Currently, there is no monitoring of the quality of water produced in these plants; and the PWA has only licensed around half of them. Lack of basic mineral content of this desalinated water is another significant issue, as the process used (reverse osmosis) removes most of the minerals found in the majority of uncontaminated surface and groundwater sources. In fact, providing “pure water”, free of these minerals, has become the competitive edge these private plants use to sell their product. The desalinated water is delivered to homes via tanker truck or individuals fill up their containers from small tanks at supermarkets and corner stores¹⁹. These water supplies cost up to \$1,30 for 100 litres, which can add up to more than a third of a poor family’s monthly income.

Before the developments of December 2008, over half of the population of Gaza City had access to water for only a few hours once a week. The ongoing blockade has prevented entry of necessary spare parts, materials and equipment for the water and wastewater facilities and has resulted in the construction of new wells with poor water quality and quick aquifer deterioration from the intrusion of

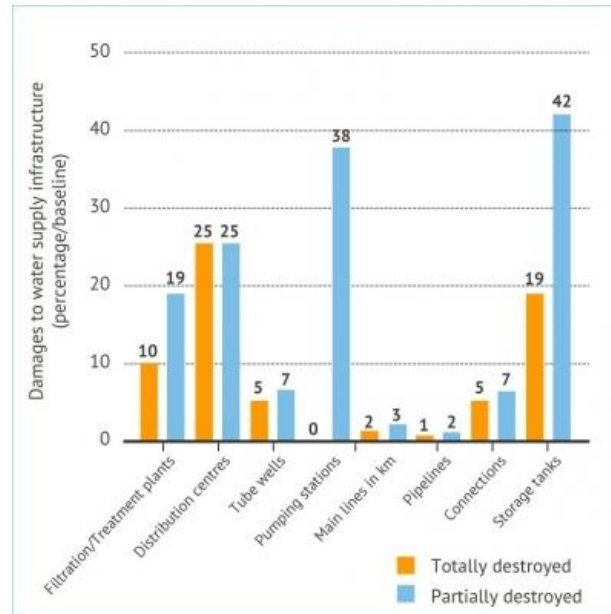
¹⁸ PWA, 2014d. *Gaza Sustainable Water Supply Program*, April 2014 (source: <https://water.fanack.com>, accessed on 1 October 2018)

¹⁹ World Bank, 2009. *West Bank and Gaza Assessment of Restrictions on Palestinian Water Sector Development*, April 2009. Available at: <http://siteresources.worldbank.org/INTWESTBANKGAZA/Resources/WaterRestrictionsReport18Apr2009.pdf>, accessed 1 October 2018.



untreated sewage and seawater. These issues have become even more acute since Israel's Operation Protective Edge (July-August 2014), which further damaged existing infrastructure (Fig. 0-5)

Figure 0-4: Overview of damages to Gaza's water supply infrastructure after the 2014 conflict in % of the baseline. Source: Fanack after UNICEF, 2014.



0.3.3 Agricultural Water Use in the West Bank and Gaza

Agriculture is considered highly important to the Palestinian economy, as it makes up 25% of exports and directly employs around 117.000 Palestinians. However, agriculture contributes only about 12% to Palestinian GDP, while continuing to be the largest consumer of water, accounting for more than 62% of total use according to the World Bank.

The amount of water currently used for irrigation is about 141 MCM/yr to irrigate around 200.000 dunum (1 dunum is about 0,1 hectare) in the West Bank and Gaza Strip, of which 55 MCM/yr is used in the West Bank and 86 MCM/yr in the Gaza Strip²⁰. In other words, each irrigated dunum in the Gaza Strip receives about four times more water per year than the average Gazan, while in the West Bank, each irrigated dunum receives between about five and 39 times more water per year than the average West Bank Palestinian.

0.3.4 Water Infrastructure in Palestine

For the time being, Palestinians are struggling to develop and maintain even the most basic water infrastructure and services.

A fact worth mentioning is that the Palestine is almost totally dependent on international donations to fund any infrastructure development project. International donors see their role in funding Palestinian

²⁰ PWA, 2014c. *Final Water Sector Policy and Strategy, 2014* (source: <https://water.fanack.com>, accessed on 1 October 2018)



development in the context of the Oslo Accords (i.e. supporting the “peace process”). As a result, they will only provide funding if the projects have first been approved by the JWC²¹.

0.3.4.1 Connection to the water grid

According to the Joint Monitoring Program (JMP) of the World Health Organization (WHO) and UNICEF, about 90% of the Palestinians in the Territories had access to an improved water source²².

A survey carried out by the Palestinian Central Bureau of Statistics (PCBS) found that the number of households in the Palestinian territories connected to the water network was 91,8% in 2011. In the West Bank, 89,4% of the households were connected while the connection share in the Gaza Strip was 96,3%²³. Currently (2017), the number of households in the Palestinian territories connected to the water network has increased to 93,3%.

According to a 2004 study by Karen Assaf, there are low service levels especially in small villages and refugee camps. The gap between urban and rural areas concerning water supply house connections may be due to the fact that available water resources are not accessible for the Palestinian actors in many cases. In 42% of the localities, water supply got uninterrupted; 19% received it at least partially. Furthermore, about 40% of all served localities suffer from water shortages²⁴.

The Euro-Mediterranean Water Information System (EMWIS) states that continuity in whater supply in the Palestinian territories is 62.8%²⁵.

0.3.4.2 Water cisterns

Due to unreliable water delivery, virtually every Palestinian house has at least one, most several, water cisterns to store water.

0.3.4.3 Water losses and sewage problems

In 2012, the losses of water in the network were estimated some 28% in the West Bank and even half of the supplied amount in Gaza²⁶.

In the West Bank, construction and maintenance of water and sewage infrastructure are problematic. The Palestinian areas are enclaves in the Israeli-controlled Area C. Therefore, all projects are subject to approval of the Joint Water Committee and the Israeli side.

²¹ Selby, J., 2013. 'Cooperation, Domination and Colonialism: The Israeli-Palestinian Joint Water Committee' *Water Alternatives*, vol. 6(1): 1-24. Available at: <http://www.water-alternatives.org/index.php/volume6/v6issue1/196-a6-1-1/file>, accessed 1 October 2018.

²² WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation, *A Snapshot of Drinking-water and Sanitation in the Arab States – 2010 Update*, p. 5., November 2011. on wssinfo.org, Joint Monitoring Programme

²³ Palestinian Central Bureau of Statistics, *Household Environmental Survey, 2011—Main Findings*, p. [13] (English section), December 2011

²⁴ Karen Assaf, "Water as a human right: The understanding of water in Palestine" (PDF). Heinrich Böll Foundation, 2004

²⁵ Euro-Mediterranean Water Information System (EMWIS) (September 2005). "Local Water Supply, Sanitation and Sewage. Country Report Palestine"

²⁶ Palestinian Central Bureau of Statistics, *Quantity of Water Supply for Domestic Sector and Water Consumed*, 2012.



In Gaza, the infrastructure is subject to periodic large-scale destruction due to conflicts with Israel, such as in the 2004 Raid on Beit Hanoun²⁷. The groundwater in Gaza is highly contaminated by leaked sewage.

The high water loss rates are ascribed to illegal connections, worn out pipe systems in the networks, and utility dysfunction. Especially in the Gaza Strip, high losses are caused by illegal connections. Illegal use of water is often the result of water shortages and insufficient supply. Furthermore, the conditions of water supply utilities suffer from grave deficiencies causing high leakage rates and a weak water pulse in the system, ascribed to both institutional weakness and the restrictions on the development of the water and sanitation sectors²⁸.

0.3.4.4 Wastewater treatment

About 90% of the Palestinians in the Territories had access to improved sanitation in 2008²⁹. Cesspits were used by 39% of households, while access to the sewer network increased to 55% in 2011, up from 39% in 1999³⁰.

In the Gaza strip, from the 110.000 m³ of wastewater per day which is produced in the Gaza Strip, 68.000 m³ was treated, according to a study from 2001. 20% of the treated wastewater was reused³¹.

The World Bank reported in 2009 that the three existing wastewater treatment plants work discontinuously³². Damaged sewage infrastructure can often not be repaired due to the ongoing blockade. It leads to delays in repairs and a lack of electricity and fuel which would be necessary to operate the wastewater treatment facilities. The United Nations estimate that per day 50.000 to 80.000 cubic meters of untreated and partially treated wastewater are discharged into the Mediterranean Sea since January 2008, threatening the environment in the region³³.

In the West Bank, only 13.000 out of 85.000 m³ of wastewater were treated in five municipal wastewater treatment plants in Hebron, Jenin, Ramallah, Tulkarem and Al-Bireh³⁴. The Al Bireh plant was

²⁷ Office for the Coordination of Humanitarian Affairs (OCHA), Preliminary Humanitarian Situation Report Operation "Forward Shield", 20 August 2004

²⁸ Palestinian Hydrology Group (PHG), Water for Life, pp. 45-46. Water, Sanitation and Hygiene Monitoring Program (WaSH MP) 2007/2008.

²⁹ WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation, A Snapshot of Drinking-water and Sanitation in the Arab States – 2010 Update, p. 5., November 2011. On wssinfo.org, Joint Monitoring Programme

³⁰ Palestinian Central Bureau of Statistics, Household Environmental Survey - Main Findings, p. [13] (English section), December 2011

³¹ D. Fatta, Z. Salem, M. Mountadar, O. Assobhei and M. Loizidou, D.; Salem, Z.; Mountadar, M.; Assobhei, O.; Loizidou, M. (December 2004). "Urban Wastewater Treatment and Reclamation for Agricultural Irrigation: The situation in Morocco and Palestine". *The Environmentalist*. Springer Netherlands. 24 (4): 227–236.

³² World Bank, Assessment of Restrictions on Palestinian Water Sector Development, p. 30, April 2009.

³³ United Nations, "Gaza water crisis prompts UN call for immediate opening of crossings", September 3, 2009

³⁴ D. Fatta, Z. Salem, M. Mountadar, O. Assobhei and M. Loizidou, D.; Salem, Z.; Mountadar, M.; Assobhei, O.; Loizidou, M. (December 2004). "Urban Wastewater Treatment and Reclamation for Agricultural Irrigation: The situation in Morocco and Palestine". *The Environmentalist*. Springer Netherlands. 24 (4): 227–236.



constructed in 2000 with funding by the German aid agency KfW³⁵. According to the World Bank report, the other four plants perform poorly concerning efficiency and quality.

³⁵ World Bank, *Assessment of Restrictions on Palestinian Water Sector Development*, p. 113, April 2009.



1. DESCRIPTION OF THE DEMO PROJECTS

1.1 DEMO 1 (OXFAM): «REUSE OF TREATED WASTEWATER FOR AGRICULTURE IRRIGATION IN SOUTHERN PART OF GAZA STRIP»

1.1.1 General information

1. Project name:	Re-use of treated wastewater for agricultural irrigation in Southern part of Gaza Strip
2. Contracting party:	OXFAM Great Britain
3. Provisional duration	04/2017 – 03/2020
4. Overall objective:	Contribute to more sustainable water and agricultural practices in Palestine through reducing land-based sources of marine pollution
5. Specific objective:	Strengthen integrated water resource management in the Gaza strip through innovative environmental and agricultural solutions in southern Gaza by March 2020
6. Target area:	Rafah and Khan Younis Governorates, Gaza
7. Target population:	100 Farmers Families; Municipal Wastewater Treatment Staff; Casual Agricultural Laborers; Individuals/ inhabitants across the entire Rafah Governorate
8. Partners/ Beneficiaries:	Oxfam Great Britain – Lead Beneficiary /Coordinator Palestinian Agricultural Development Association PARC - Beneficiary Palestinian Environmental Friends (PEF) - Beneficiary Oxfam Novib - Affiliated Entity to Oxfam Great Britain (allowing Oxfam GB to transfer funds to Oxfam OPT Country programme through OXFAM Novib)
9. Budget :	€ 2.176.375

1.1.2 Background

Poor water quality and high levels of water demand in the Gaza Strip are increasingly leading to water scarcity, as highlighted by the PWA (Water Resources Status Report, 2015). Currently, there is an estimated annual cumulative deficit of water of about 80 - 100 MCM/year. The coastal aquifer in the Gaza Strip receives an annual average recharge of 55 - 60 MCM/year from rainfall with an additional 30 million cubic meters (MCM/year) from lateral ground water flow and leakages, while the annual intensive abstraction rates from the aquifer is about 200 MCM. More than 43% of the available groundwater, which is the only water resource, is being severely exploited for agricultural irrigation, while the remaining is used for domestic water supply and industry. The groundwater quality is rapidly deteriorating and is contaminated with a high salinity level of chloride concentrations, exceeding the



1000 mg/l standard according to the Food and Agriculture Organisation (FAO) standards for agricultural irrigation.

The PWA's recent water report reveals that there is a rapid and massive decline in the level of groundwater below the mean sea water level (MSL), causing seawater intrusion. The water measurements demonstrate that there is a large cone depression in Rafah governorate of about -19 m below MSL, considered as the maximum water level decline in the Gaza strip. According to the Palestinian Ministry of Agriculture (MoA), the total cultivated area in the Gaza Strip has increased from 189 thousand dunams in 2012 to 201 thousand dunams in 2014, with water consumption for crops at 92,7 MCM annually, while the remaining 2,6 MCM is used for livestock. This agricultural demand is outstripping the water supply, which will have long-term deleterious effects and requires immediate and urgent solutions.

The major cost element in water reuse is attributed to the capital investment costs required in the construction of the wastewater treatment plant. Therefore, treatment cost minimization remains one of the prevailing objectives in wastewater treatment. Proper selection of crops types for irrigation also provides the highest potential and cost effectiveness approach for water reuse.

These findings are reinforced by a rapid assessment undertaken by Oxfam with the Palestinian Agricultural Development Association (PARC) and Palestinian Environmental Friends (PEF) in August 2016, specifically for Al-Shouka area, east of Rafah governorate. Farmers have adopted a wide range of coping and adaptation strategies, some of which have burdened them financially and decreased their profits, including the purchase of tank water from private water vendors at high costs that amount to 2 – 2,5 NIS per cubic. However, farmers are able to pay 0,5-1,0 NIS for treated wastewater.

The assessment of wastewater treatment plants (WWTP) in the southern areas of the Gaza Strip (Khan Younis and Rafah) shows that upgrading of Rafah WWTP is required to reach the treatment requirements defined for reuse of wastewater. Currently, more than 10.000 m³ of partially treated wastewater is being generated by Rafah WWTP on a daily basis and is being discharged directly into the Mediterranean Sea, causing environmental degradation and pollution.

Based on these issues, Oxfam with its partners are engaged to the implementation of a 3 year action for the Re-use of treated wastewater for agricultural irrigation in Southern Gaza Strip.

The post treatment plant that will be implemented by Oxfam and its local partners is a part of national project, which includes two additional post treatment plants, which will be implemented by PECNDAR after getting the needed fund from the Japan International Cooperation Agency (JICA) and will pump the water to the western area. UNDP will be responsible to establish special solar system to provide the three post treatment plants with electricity in full coordination with the MoA, CMWU, PWA, PECNDAR and Oxfam. Noting that the site of implementation was identified to implement the additional treatment plant through PECNDAR based on availability of fund.



1.1.4 Overview of the project

1.1.4.1 Introduction

1.1.4.1.1 Goal and objectives

The project *Re-use of treated wastewater for agricultural irrigation in Southern Gaza Strip* **overall goal** is to contribute to more sustainable water and agricultural practices in the Gaza strip through reducing land-based sources of marine pollution.

Its **specific objective** is to strengthen integrated water resource management in the Gaza strip through innovative environmental and agricultural solutions in southern Gaza (Rafah and Khan Younis Governorates).

By March 2020, up to 213,124 inhabitants, 49% of them females and 41% infants and young children, in Rafah is expected to benefit from this action. Specifically, the action will directly support 650 individuals (49% female and 51% males) including livestock farmers and their children, community committees, and stakeholders' organizations.

100 farmers (50 men and 50 women) will be directly targeted by this action.

1.1.4.1.2 Partners & stakeholders

The project is implemented by the following partners:

1. Oxfam: Responsible for monitoring the overall project implementation and providing technical support, facilitation of Steering Committee meetings, legal framework, partnership coordination and management, and budget.
2. Palestinian Environmental Friends (PEF): Responsible of the design of the treatment plant, carrier line, environmental monitoring and management program (EMMP), monitoring of community mobilizers to identify people to be trained for the management and maintenance at the technical level.
3. Palestinian Agricultural Development Association (PARC): Responsible of public awareness, dealing with the local committee and farmers (mainly the soft component related to working with community members and farmers).

Involved stakeholders include the following:

- Coastal Municipal Water Unit (CMWU);
- Ministry of Agriculture (MoA);
- Ministry of Health (MoH);
- Palestinian Water Authority (PWA);
- Environmental Quality Authority (EQA).

1.1.4.1.3 Target Area

According to the Action's original design, Al Shouka was intended to be the targeted area to address small scale farmers' limited access to suitable irrigation water, and, ultimately, to improve the



deteriorating economic conditions of Al Shouka community. However, the community and farmers rejected the Action in Quarter 3 of Year 1 due to the lobbying efforts against the Action by four major large-scale and influential Al Shouka farmers who completely rejected TWW usage for agricultural irrigation.

After conducting a rapid needs assessment, Al Mawasi was confirmed as the new targeted area of the Action in the Rafah Governorate; as all relevant stakeholders approved the intervention in the new area. This decision to re-locate to Al Mawasi received formal EU endorsement after informing the EU Delegation in Jerusalem in March 2018. This decision was also fully endorsed by the PSC, the PWA, and the MoA, as it aligned with in the two latter's strategic plans.

Al Mawasi is a rural area located at the South-Western part of Rafah, with the Mediterranean Sea to the West, the Egyptian borders to the South, Khan Younis city to the North and Rafah to the East. The area stretches on 4.000 dunams divided by Al Bahar Street to 1.200 dunams in the Southern side and 2.800 dunams in the Northern part of Al Mawasi.

The Oslo Agreement has classified Al Mawasi to be "yellow areas" where Israeli is responsible for the security issues while the Palestinian Authority is responsible for the civil matters of the 5.000 residents of the region, most of which work in the fishing and agriculture sectors.

The region suffers from a general lack of basic infrastructure as a result of over thirty years of neglect. The signs of such neglect are evident by the absence of health and educational facilities other than Jarar Al Qidwa School, which was opened in 1998 in Mawasi Khan Yunis under the auspices of the Palestinian Authority, in addition to the absence of health services except for a small hospital in Mawasi Rafah. Furthermore, the region is plagued with a general lack of communication, sewage, electrical, and water networks as residents depend on digging for underground water for their daily water intake.

The selection of the area is a recommendation proposed by the MoA because the area is subjected to severe fresh water scarcity due to groundwater abstraction and close proximity to the seashore. In addition, Al Mawasi experiences high-water consumption due to agricultural activities, making this area the number one victim of water quality deterioration.

Other major factors for selecting Al Mawasi in Rafah include:

- Strategic Alignment: By targeting Al Mawasi, Oxfam is aligned with PWA's feasibility study for the TWW reuse in Southern Gaza and MoA strategic plan (2016-2020);
- Water Quality Needs: Al Mawasi experiences high levels of groundwater salinity due to its proximity to the seashore, Al Mawasi agricultural lands suffer from seawater intrusion and deteriorating groundwater quality. Currently, the groundwater salinity levels at Mawasi Rafah can peak as high as 10.000 mg TDS per liter; and
- Logistics: Al Mawasi is closer the TWW source which is RWWTP.

Last, Al Mawasi is considered a more safe area compared to the Al Shouka which is located closer to the Eastern Rafah- Egyptian border. In particular, the Palestinian Border Authority initially approved the proposed pathway of the carrier line in September 2017. However, border tensions escalated during February 2018; and thus, the Border Authority informed PEF that it would be reluctant to support the construction activities.



Below is the map on which the Al Mawasi area is indicated³⁶.

On the same map, it is depicted the “sufficiency of water supply” of all areas.

Map 1-1: Gaza map - The target area



³⁶ Source: Palestinian Hydrology Group, “Water, Sanitation and Hygiene Household Survey, Gaza”, 2010



1.1.4.1.4 *Project methodology*

The design of the action incorporates key issues of environmental and institutional sustainability of water as a public good in the Gaza Strip, including the long-term economic viability and replicability of the intervention, linking humanitarian responses with sustainable development.

The design of the action aims to achieve sustainable implementation of this innovative approach through inter-linking **five core components**:

1. Design and development of infrastructure;
2. Public engagement, awareness raising and knowledge development;
3. Business model;
4. Governance;
5. Learning and knowledge sharing.

By taking this approach, the project aims to incorporate all the necessary aspects to both implement and demonstrate the effectiveness of an innovative waste-to-value solution that addresses chronic water security issues and provides additional environmental and economic benefits.

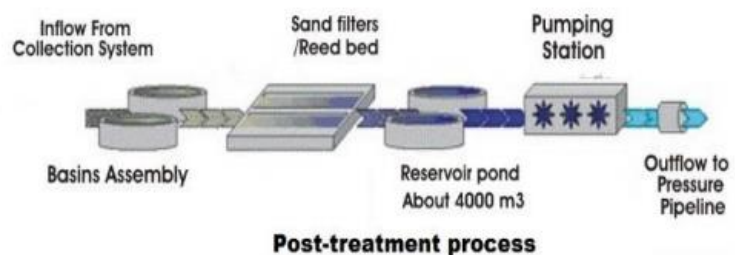
A gender analysis will be incorporated into the design to ensure a balanced representation that includes the specific needs, views and feedback of women.

2.000 m³/day will be pumped for 200 donums at the eastern area of Rafah

and the recommended technology that will be applied at the PTP is a soil adsorption ponds “sand filters” that will be used to treat the influent of 3.600 m³/day of partially treated wastewater from RWWTP with average BOD is 160 mg/l. The average BOD of treated effluent must be within the guidelines values of Palestinian standard of 45 mg/l. The BOD removal efficiency of the sand filters and BOD shall be 72%. PARC will work with local stakeholders and community committees. Verification visits and surveys will be organized and conducted through field visits to 100% of short-listed applicants, and home visits to 50% of short-listed applicants. Final lists of farmers will be shared with the partnership associations, local committees, and CBOs, including those farmers who do not qualify for the programme. PARC will solicit feedback from farmers and community representation, before announcing the final shortlist of selected farmers to the public.

The hardware construction elements of this action, will be overseen by PEF, who will oversee the design, construction, and training of staff on the operational and maintenance of developed infrastructure. Construction for the action’s infrastructure will be tendered competitively to competent contractors. PEF will oversee and manage selected contractors to ensure deliverables are met.

Oxfam will function as a broker between all relevant stakeholders and its partners, and bring them together in order to ensure participation and buy in from the start in order to bring this action to a success. Oxfam will facilitate steering committee meetings on a semi-annual basis. Oxfam will ensure coordination with other NGO’s as well as dissemination of information about the action to relevant stakeholders. Oxfam’s HQ will contribute technical knowledge and expertise gained from global WASH programmes.





Project **outputs** include:

1. 200 dunums of productive agricultural land irrigated by reuse of TWW through an innovative and sustainable waste water treatment and irrigation system;
 - Community Mobilization, gender analysis research, and selection of targeted agricultural lands and farmers
 - Conduct Engineering Assessment and Design for Construction Work
 - Construction of drip irrigation system/network for 200 dunums of agricultural land
 - Carry out capacity building and training of targeted farmers, on the practical aspects and application of waste water re-use for irrigation
 - Carry out capacity building and training of TWWP operators, engineers and specialists on the practical aspects and applications of the post-treatment filtration process
2. Wastewater re-use management institutionalized through development and activation of a legal framework and governance model that includes a sustainable and equitable tariff system;
 - Development of a legal framework for treated waste water re-use management and monitoring, to be endorsed by PWA as sector regulator
 - Exploration of possible women's leadership role in water financing mechanisms
3. A monitoring and verification system for the full treatment and reuse cycle, from soil through to product quality monitoring, established and activated;
4. A replicable model for TWW re-use for agricultural irrigation developed and evaluated;
5. Acceptance of using TWW for agriculture irrigation among farmers and consumers.

1.1.4.2 *Progress in brief*

In the course of the reporting period, activities were carried out according to the methodological approach included in the project inception report.

Particular effort was given mainly in preparatory actions aiming to put the foundation needed for the effective realization of the planned outputs.

Specific tasks carried out and results achieved in the reporting period are summarized as follows:

- Formation of successful partnership and synergies between Oxfam and government stakeholders such as the PWA, CMWU, MoA, and MoH through its local partners and the PSC;
- Actions aiming to increase the acceptance of using TWW for agriculture irrigation among farmers and consumers;
- Reallocation of the action from Al Shouka community to Al Mawasi in Rafah Governorate, accompanied by successful mitigation measures undertaken by Oxfam and its partners;
- Beginning technical design and legal frameworks;

Some activities are slightly behind schedule mainly due to the re-location of the action to Al Mawasi and other unexpected factors: delays in the tendering process for construction works; political conditions such as the closure of Beit Hanoun check point and inter conflict between Authorities in Ramlla and Gaza.



1.1.4.3 *Progress in detail*

Oxfam, and its local partners PEF and PARC made progress in implementing activities under the five Outputs during the reporting period.

Oxfam's project annual review concluded that the activities conducted during the first year went well in terms of planning, coordination, communication, and legal framework preparations.

The following issues should be stressed out:

1. As already mentioned, the Action's targeted location was moved from Al Shouka to Al Mawasi following a rapid needs assessment which was conducted in March 2018. Oxfam received official approval from the EU to change the location; however, the same number of beneficiaries will need to be reached in the new area.
2. The results of the aforementioned needs assessment determined that 98% of the farmers in Al Mawasi accepted TWW reuse as many farmers have left their lands, and thus, their livelihoods, due to the detrimental water shortage. Therefore, it was recognized that a sustainable solution is needed in Al Mawasi to ensure that farmers can irrigate tree crops to support their households.
3. The Al Mawasi solution does not require a reservoir to be constructed, as water will be pumped directly from the harvesting pond on each farm and will utilize the drip irrigation system. The length of the carrier line will be shorter than the one initially designed for Al Shouka and its path will be installed in a safe area, away from the Egyptian border. The total number of planned dunums (200) and the planned number of farmers (100) proposed in the Action will not change.
4. Due to the availability of the harvesting pond; the shorter length of the carrier line; the support of MoA and all members of PSC; the acceptance of Al Mawasi community and absence of rich, powerful and negative influencer farmers; and complimentary PECNDAR intervention in West Mawasi; it is expected that the Action will be completed and all results will be achieved by March 2020.

The expected outputs/results required to meet the specific objective of this action (based on Oxfam's annual report) are as follows.

1.1.4.3.1 **Output 1**

200 dunums of productive agricultural land have been irrigated by reuse of TWW through an innovative and sustainable waste water treatment and irrigation system

- Indicator 1.1: # dunums of agricultural land irrigated using treated waste water

The achievement of this indicator is directly linked to the accomplishment of the Post WW Treatment Unit as well as the identification of the agricultural lands to be targeted.

During the first year, zero (0) dunums of agricultural land were irrigated using treated wastewater due to the challenges faced in Al Shouka community, delaying the implementation of output 1.

During this period, Oxfam and implementing partners have selected 200 dunums of land for irrigation by TWW targeting the small-scale farmers in Al Mawasi.

- Indicator 1.2: A fit for purpose treated waste water reuse irrigation system has been constructed and is operational



The WWRU irrigation system was not constructed during the first year. However, the preparation for constructing and operating the WWRU system began in November 2017 with the design of the Terms of Reference of construction responsibilities and procedures. This sign-off was delayed by the Project Steering Committee (PSC) due to the instability of the main treatment plant outlets quality. The microbiological contamination level was too unstable which delayed the ToR, specifically concerning sand filtration responsibilities, and complicated the type of treatment needed.

Oxfam worked closely with the Coastal Municipality Water Unit (CMWU) and PWA to design the most realistic and applicable design, which included the BOQs and cost estimations, for the post-treatment unit during Year 1. However, the ToR has now been completed and construction will begin in Year 2 of the Action. This system is expected to be completed by January 2019 and progress on the indicator should be clear in Year 2.

■ Indicator 1.3: % targeted farms (in Dunums) have functional irrigation systems

This indicator has not been achieved as it is dependent on the selection of beneficiaries and targeted agricultural lands in Al Mawasi. Despite the area change from Al Shouka to Al Mawasi, the planned target has not changed and the Action aims to ensure that 100% of irrigation systems are functioning in Al Mawasi's targeted agricultural lands (at least 200 dunums). This is aligned with the MoA standards for TWW (dripping irrigation).

It was the intent of the originally proposed Action to ensure that 100% of the targeted Al Shouka farm lands had functional irrigation systems where, according to the rapid needs conducted in the area in August 2016, about 40% of the agricultural lands there have a functioning irrigation system. Comparatively, the Al Mawasi rapid needs assessment demonstrated that most of Al Mawasi farmers have poor access to agriculture inputs such as irrigation networks, seeds, and fertilizers. Farmers also reported none are using the dripping irrigation system needed for TWW irrigation.

An accurate percentage of agricultural lands served by functional irrigation networks has been identified during the second baseline that was carried out in Al Mawasi area during the summer of 2018 (figure not available).

Thus, progress on this indicator shall be evident in Year 2.

■ Indicator 1.4: # m3 of TWW pumped daily to agricultural lands

As the WW Post Treatment Unit has not been constructed and the targeted agricultural lands have not been finalized, 0 m³ of TWW has been pumped daily to targeted agricultural lands.

1.1.4.3.2 **Output 2**

Wastewater re-use management institutionalized through development and activation of a legal framework and governance model that includes a sustainable and equitable tariff system

■ Indicator 2.1: An institutional unit for wastewater treatment established with clear roles and responsibilities (WWRU)

The institutional unit for wastewater reuse has not yet been established. The PSC reviewed the plan for the institutional unit which will be implemented in March 2019, during Year 2 of the Action.



The roles and responsibilities of the WWRU were defined and signed off in summer of 2018. Progress on this indicator will be reported in Year 2.

- [Indicator 2.2: A committee/association of wastewater users established with clear roles and responsibilities and connected to the WWRU](#)

The committee was established in July 2018 in Al Mawasi after the establishment of the WWRU. Progress on this indicator will be reported in year 2.

- [Indicator 2.3: % of farmers committed to the TWW tariff conditions](#)

Due to the delays caused by the challenges in Al Shouka, the TWW tariff system is planned to be developed and implemented in Year 2; upon the selection and formal commitment of farmers in Al-Mawasi area to the conditions. According to the rapid needs assessment conducted in Al Mawasi area in March 2018, the majority of Al Mawasi farmers have indicated a strong willingness to pay for the TWW on the condition that it meets the PWA standards. More accurate findings will be identified during the second project review expected in April 2019.

1.1.4.3.3 **Output 3**

A monitoring and verification system for the full treatment and reuse cycle, from soil through to product quality monitoring, has been established and activated

- [Indicator 3.1: A clear monitoring strategy developed and approved to follow up waste water reuse system from source to the produced crops](#)

The monitoring strategy has not been fully developed to follow up the TWW reuse system. The monitoring strategy will monitor the use of TWW from source to crop through clear monitoring plan that includes water, soil, and crops quality testing". This strategy will be designed by the WWRU as part of its mission. It will be a continuous process starting from September 2018 until the end of project and will be adapted based on the practical lessons learnt to ensure sustainable water source for agriculture practices in Rafah. However, Oxfam partners PEF and PARC will lead implementation as members in the WWRU and they will provide the needed capacity building to other stakeholders especially CMWU, PWA, and MOH.

The strategy will be developed and approved in Year 2.

- [Indicator 3.2: All waste water received by farmers are within the monitoring and verification system and procedures](#)

TWW has not yet been received by the target farmers as the WW Post Treatment Unit has not been constructed; the targeted agricultural lands have not been finalized; and the monitoring strategy has not been fully developed. Progress on this indicator should be assessed after the completion of the infrastructure activities.

- [Indicator 3.3: % of farmers and workers who are compliant with the monitoring and verification system and procedures](#)



This indicator should be addressed after the establishment of the monitoring strategy in Year 3 of the Action.

1.1.4.3.4 **Output 4**

A replicable model for TWW re-use for agricultural irrigation developed and evaluated

- [Indicator 4.1: # of other \(not targeted\) farmers are supporting WWT model replication at their lands \(both women and men farmers\)](#)

This indicator will be measured once the following activities have been completed: establishment of the WW Post Treatment Unit; development of the legal framework and tariff system for TWW; establishment of the institutional WW reuse unit; establishment of the monitoring strategy; and awareness activities and knowledge sharing completed in Rafah. By the end of the project, this indicator shall be updated.

- [Indicator 4.2: # of monitoring and evaluation and dissemination events conducted to promote the replication of TWW reuse](#)

No events were conducted as TWW reuse replicable model has yet to be established.

1.1.4.3.5 **Output 5**

Acceptance of using TWW for agricultural irrigation has been generated among farmers and consumers

- [Indicator 5.1: # workshops and # men and women awareness sessions conducted to raise public awareness to accept and use TWW irrigated products](#)

During Year 1, zero (0) formal workshops were conducted. However, in Year 1, 500 awareness sessions were conducted to spread awareness and acceptance of TWW-irrigated products. Throughout Year 1, 170 sessions, consisting of 1600 people (approximately 45% of the targeted audience were women), were conducted. The message focused on spreading awareness on the water shortage and pollution situation in the Gaza strip, how TWW reuse for irrigation as part of the solution, and the Action's purpose, nature and anticipated activities. The sessions received a large amount of support and indicated a strong interest from the citizens and farmers in Al Mawasi Rafah.

Al-Shuka's baseline results (September 2017) demonstrated that 97% of the interviewed sample stated that they have no objection on using TWW for irrigation due to water scarcity and the lack of alternatives. However, the power dynamics in the area affected this acceptance negatively. Four larger-scale farmers, not targeted by the Action, used their influencing power to change farmers' acceptance dramatically to reject the TWW irrigation to keep their water business in the area.

The lessons learnt from the Al-Shuka experience, is to include the wealthier and influential community members that are outside of the beneficiary selection criteria, in any planning as part of the stakeholder analysis. Oxfam will also aim to mobilize the main powers to the project outcomes by involving them in all project cycle stages from design until the handover in future Actions.



- [Indicator 5.2: % of men and women surveyed in the target area reported their participation in workshops and sessions about safety of using TWW in irrigation](#)

During the Year 1 both men and women at Al Mawasi area have either directly participated or, at the very least, are aware of the public awareness activities.

100% of women and 90% of men are satisfied on the quality and timing of the sessions. The other 10% of men were not satisfied with the time of sessions which conducted during their working hours; which Oxfam will adjust to a later hour in Year 2. These sessions contributed to raise men and women awareness about the project and the increase farmers' acceptance to use TWW for irrigation.

More accurate data were measured by the first KAP survey in August 2018.

This indicator will be finalized once the end line survey has been completed after all awareness raising activities the awareness sessions and workshops have been completed in February 2020. However, Oxfam and its local partners will track participation through attendance sheets to verify the end line results.

- [Indicator 5.3: % of men and women surveyed in the target area who showed willingness to consume products irrigated with TWW](#)

Prior to the relocation to Al Mawasi, the Al-Shuka baseline results demonstrated that 84% of the surveyed sample accepted to consume products irrigated by TWW. However, as mentioned above, the power dynamics and influence of the four large scale farmers influenced the rest of Al-Shuka population to reject the action.

The project annual review for Year 1, along with the rapid needs assessment, both demonstrated that 90% of both men and women in the Al Mawasi area have expressed a "conditional" willingness to consume products irrigated with TWW. The surveyed population requested clarification concerning the quality control procedures. Should the monitoring procedures not meet their expectations, they will not be willing to consume TWW products. Oxfam and its partners will ensure the quality control procedures as part of the monitoring strategy and the WWRU roles and responsibilities. Oxfam will also build the capacity of its partners PEF and PARC and the WWRU members on the TWW quality control.

- [Indicator 5.4: % of men and women farmers who reported that their TWW irrigated products have been sold direct to consumers](#)

This indicator will be reported on after conducting the post-harvesting questionnaire and farmers FGDs once the TWW irrigated products have been harvested.

**1.1.4.5** *Financial information***Implementation period of the contract (01/04/2017 - 31/03/2020)**

Amounts in €

Budget Line	Total Budget	Year 1 Budget	Expenditures up to Feb18	% of Spend
Subtotal Human Resources	684.496	223.204	160.047	72%
Subtotal Travel	31.046	9.034	3.042	34%
Subtotal Equipment and supplies	12.132	9.688	5.598	58%
Subtotal Local office	44.632	16.227	11.786	73%
Subtotal Other costs, services	76.350	23.283	248	1%
Subtotal Other	1.094.536	296.231	16.810	6%
Subtotal direct eligible costs of the Action	1.943.192	577.667	197.532	34%
Indirect costs 7%	136.023	40.437	13.827	34%
Total eligible costs of the Action, excluding reserve	2.079.215	618.104	211.359	34%
Provision for contingency reserve	97.160	-	-	
Total eligible costs	2.176.375	618.104	211.359	34%



1.2 DEMO 2 (ARIJ): «PROMOTE WASTEWATER TREATMENT AND REUSE IN THE WATER SCARCE AREAS OF THE MIDDLE EAST & NORTH AFRICA THROUGH DEVELOPMENT AND DEMONSTRATION OF INNOVATIVE INSTRUMENTS AND INCLUSIVE MANAGEMENT PLANTS»

1.2.1 General information

1. Project name:	Promote wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa through development and demonstration of innovative financial instruments and inclusive management plans
2. Contracting party:	Applied Research Institute-Jerusalem (ARIJ)
3. Provisional duration	03/2017 – 02/2018
4. Overall objective:	Promote wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa (MENA) by developing scalable and innovative financial instruments and inclusive management plans that can fully recover the costs of wastewater treatment and reuse at a demonstration site in Wadi Al-Aroub, Palestine
5. Specific objectives:	<ul style="list-style-type: none">■ Demonstrate the feasibility of reducing the operational costs of WWT by:<ul style="list-style-type: none">- Generate energy via photovoltaic cells- Using innovative, cost-saving technologies for sludge dewatering■ Introduce innovative irrigation practices that enhance water productivity■ Increase sense of ownership of the local community in water as a resource■ Recovering O&M costs from the sale of treated wastewater■ Achieving maximum benefits of sound agricultural practices
6. Target area:	Sair town in Hebron Governorate - West Bank / Palestine
7. Target population:	Al Aroub refugee camp citizens; Sair town citizens; Kwazeba village citizens; Farmers in Wadi Al Aroub
8. Partners/ Beneficiaries:	No affiliated entities. Main indirect beneficiaries include the following : Ministry of Local Government (MoLG); Sair Municipality; Palestinian Water Authority (PWA)
9. Budget :	Payment from EU € 948.798 / Total Expected € 1.195.110



1.2.3 Background

Reduction of Plant Operational Costs

The average O&M cost of wastewater treatment at Al-Aroub station in 2016 was 0,4 EURO/m³. This is similar to the average cost of wastewater treatment in the Middle East and North Africa (MENA) estimated to range between 0,38 and 0,58 US\$/m³. However, the Israeli Water Commission and Ministry of Agriculture wastewater planning guidelines set the O&M cost of treatment of sewage at 0,22 EURO/m³ for high quality secondary effluent (BOD and TSS of 20 and 30 mg/L), which is almost half of the O&M treatment cost encountered elsewhere in MENA.

The two major items increase the cost of wastewater treatment in Palestine and in the MENA region: the improper management of the generated sludge and the consumption of electricity.

At Al-Aroub WWTP, sludge is thickened to 2,5% dry solid (DS) content using gravity thickener and is then transported in vacuum tankers for final disposal at Al-Minya sanitary landfill. The cost of thickened sludge transport and disposal is approximately 7,7 EURO per m³ (equivalent to 0,16 EURO/m³ of treated wastewater). The high financial and environmental costs of generated sludge disposal are problematic not only at Al-Aroub wastewater treatment plant but also for most wastewater treatment plants in developing countries including these in the Middle East and North Africa (MENA) region.

In Palestine, none of the wastewater treatment plants have facilities for dewatering and stabilizing the generated sludge and while most of the generated sludge in Egypt and Jordan is dewatered to concentrations of 40-60 % DS, the generated sludge is rarely stabilized and thus does not fit Egyptian, Jordanian, or international standards, especially pathogen limits.

Another major contributor to the operational cost of wastewater treatment plants is energy consumption. Tsagarakis et al. (2003)³⁷ reported energy consumption for conventional and extended aeration systems in Greece to range between 17 kWh per person equivalent (p.e.) and 26 kWh per p.e.

The current energy consumption at Al-Aroub wastewater treatment plant is 23,8 kWh per p.e and hence falls within the range reported in Tsagarakis et al. However, the high retail price of electricity in Palestine (EUR 0,16/kWh), which is the highest in the Middle East Region, escalates the operational cost of treatment. The cost of electricity currently accounts for 32% of the total O&M costs at Al-Aroub wastewater treatment plant.

Innovative irrigation and nutrient management practices

It is imperative to reuse the treated wastewater in agriculture in the MENA region to: (1) reduce water deficits in the most stressed region worldwide; (2) reduce the pressures on overexploited groundwater aquifers; and (3) increase food security. This coupled with increases in water use efficiency from adaption of water saving techniques will increase resilience to climate change in a region expected to suffer from longer drought periods and 10-20% shortfall in average precipitation by the end of this century.

In spite of the acknowledged importance of treated wastewater reuse in agriculture, most of the treated effluent in the MENA region is being discharged into water bodies or ephemeral streams.

³⁷ K. Tsagarakis, D. Mara, A. Angelakis, *Application of cost criteria for selection of municipal wastewater treatment systems. Water, Air, and Soil Pollution* 142, 187-210 (2003).



In Palestine, less than 5% of the treated wastewater was reused in agriculture in 2015. This is paradoxical given fresh water shortages and the consumers' willingness to consume agricultural products irrigated with reclaimed water.

Qadir et al. (2010)³⁸ and Mizyed (2012)³⁹ partially attributed the limited use of treated wastewater to inefficient irrigation and water management schemes and lack of clearly defined property rights of the water resource.

Youth in the project area and in Palestine in general are abandoning agriculture due to the meagre agricultural yields from rain-fed agriculture. Even where freshwater is available, the high costs of agricultural inputs such as chemical fertilizers and pesticides, and low water use efficiencies due to inefficient irrigation and water management schemes, and incorrect application of 'hi-tech'-high water efficient irrigation technologies are all factors reducing the economic gains from irrigated agriculture.

Develop enterprises capacities to manage the reuse of treated wastewater and sludge

The agricultural cooperative in Wadi Al-Aroub does not have the sufficient management, governance, financial and technical capacities to operate the irrigation network. Farmers and agricultural extension agents, on the other hand, generally lack adequate training in managing the on-farm SDI system or to utilize the DSS for irrigation scheduling. Furthermore, composting sludge has different monitoring and operating requirement from composting municipal waste. None of the Palestinian national authorities, local authorities, NGOs, the private sector, or the agricultural cooperatives have experience in managing a sludge-composting facility.

Supply chain management, quality standards, and product marketability

Most of the Palestinian farmer's products are sold to central markets and wholesaler retailers. Central markets and wholesale retailers in turn supply small retailers who sell the product to the consumer. This long supply chain is inefficient. In general, it increases prices for consumers and equally important reduces profits for the farmers(24). In less economic developed countries, the problem of production-consumption price polarization is extremely serious, causing phenomena such as the progressive impoverishing of agricultural workers. For instance, in Palestine, 82% of the national produced almond crop is sold directly to central markets at an average price of 3,3 EUR/kg.

Shortening the supply chain by connecting producer and consumer cooperatives can bring significant economic gains to the farmers and can simultaneously reduce the cost the consumer pays for the crop. Consumer cooperatives in Palestine pay an average 5,41 EURO/kg of almonds directly to the farmer and sell to the consumers at an average price of 6,11 EUR/kg¹⁶. At the end of the supply chain, consumers buy almonds from the consumer cooperatives at a price of 25NIS/kg compared to an average price in the retail market of 7.52 EUR/kg. This clearly indicates that long supply chain reduces the profit for the farmer and increase the price of the product for the consumer and highlights the importance of connecting producer cooperatives with consumer cooperatives and fair trade organizations.

³⁸ M. Qadir, A. Bahri, T. Sato, E. Al-Karadsheh, *Wastewater production, treatment, and irrigation in Middle East and North Africa. Irrigation and Drainage Systems* 24, 37-51 (2010).

³⁹ N. R. Mizyed, *Challenges to treated wastewater reuse in arid and semi-arid areas. Environmental science & policy* 25, 186-195 (2013)



The current demand of the fodder crop alfalfa, on the other hand, is mostly met through imports from Israel. There is currently no classification of alfalfa grade quality in Palestine. In 2015, alfalfa retail price in the Palestinian market ranged between 370 and 400 EURO per dry metric Ton (12% moisture content). For comparison, in 2015, premium+ alfalfa hay price in the USA ranged between 100-230 EUR/metric ton. The very high prices of alfalfa hay as well as hay of other grasses poses a high strain on small as well as large dairy farms. The profit margin of growing alfalfa exceeds that of fruit nut trees even if the hay is sold for 230 EUR/metric ton. However, the high water demand of the alfalfa crop (7800 m³/ha/year) has limited its cultivation in Palestine. The scaling-up of wastewater reuse for irrigating alfalfa crop will have a positive cascading effect on the animal husbandry sector.

Another issue of concern is the excessive use of chemical pesticides in the production process. For instance, pesticides cost 30% of the total almond production inputs. On one hand, this increases production cost while on the other hand, reduces the potential of the product to be marketed to consumer cooperatives and to the international markets. Consumer cooperatives are increasingly demanding sustainably produced agricultural products free of pesticides. Reducing usage, or promoting sound alternatives to, harmful chemicals, is paramount to increase the quality and profitability of the agricultural products. Furthermore, chemical fertilizers cost 20% of the total almond production inputs. Switching to composted products (animal manure compost, sludge, or plant compost material) provides a less expensive, environmentally friendly alternative that delivers nutrients to the soil and simultaneously improves soil physical characteristics such water holding capacity and thus water use efficiency and economic efficiency

1.2.4 Overview of the project

1.2.4.1 *Introduction*

1.2.4.1.1 *Goal and objectives*

The project's overall goal is to promote wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa by developing scalable and innovative financial instruments and inclusive management plans that can recover the costs of WWT and reuse at a demonstration site in Wadi Al-Aroub.

The project addresses some of the main constraints causing slow progress in WWT and reuse in the agricultural sector, namely: the high operation and maintenance (O&M) costs of WWT and reuse; the lack of cost recovery mechanisms; and inefficient irrigation and water management schemes.

The project includes the establishment of sludge dewatering and composting component, a water reuse system and a 125 Kva Photovoltaic System (PV), accompanied by the relevant supporting infrastructure, all with the purpose of making the treatment and reuse system be as self-sustainable as possible. In particular, the specific objectives of the project are as follows (objective: O – come: c):

- Oc 1: Demonstrate the feasibility of reducing the operational costs of wastewater treatment using innovative and cost-efficient technologies of energy production and sludge management
- Oc 2.1: Gain economic advantages for farmers by introducing innovative irrigation practices and nutrient management that enhance water productivity while also reducing environmental burdens.



- Oc 2.2: Increase the sense of ownership of the local community in the water resource and infrastructure.
- Oc 2.3: Promote the sustainable operation of the wastewater treatment plant by recovering some of the O&M costs from the sales of the treated wastewater
- Oc 3.1: Enhancing organizational, technical, financial and business capacities of the local agricultural cooperative qualifying it to manage treated wastewater distribution and reuse scheme
- Oc 3.2: Develop the capacity of the sludge-composting facility operator to manage the dewatering and composting facility
- Oc 4: Improve the quality, pricing, and marketability of agricultural commodities and compost

1.2.4.1.2 *Partners & stakeholders*

The Applied Research Institute-Jerusalem (ARIJ) is the coordinating entity and Sair Municipality and the resource poor farmer households in the targeted valley are the main beneficiaries.

The partnership between ARIJ and beneficiaries was built over years of cooperation and joint efforts in the field of agriculture, water and wastewater management and other related sectors. It has proved to be successful and complementary, in terms of work distribution to achieve the objectives of the project and the commitment of each party in regards to its segregation of duties, commitment and transparency.

The project's indirect beneficiaries are as follows:

- Palestinian Ministry of Local Government (MoLG)
- Sair Municipality
- Palestinian Water Authority (PWA)
- Ministry of Agriculture (MoA)
- Popular Committee of AI - Aroub camp
- Other related stakeholders such as Sair Civil Society Organization.

1.2.4.1.3 *Target area*

Map 1-2: Hebron - Sair map - The target area

The target area is Sair town in Hebron Governorate, in the southern West Bank located 8 kilometers northeast of Hebron. Nearby localities include Beit Fajjar and al-Arroub to the north, Beit Ummar to the northwest, Halhul to the west and Beit Einun and ash-Shuyukh to the south. The Dead Sea is just east of Sair municipal borders.

In the 2007 census Palestinian Central Bureau of Statistics, the town had a population of over 18.045.

It has municipal jurisdiction over 117.000 dunams, 6.000 of which is built-up area and 11.715 of which is cultivated. The main economic activities in Sair are agriculture and the Israeli labor market. Olives are the major cash crop.



1.2.4.1.4 *Project methodology*

The project builds on the achievements, results and challenges obtained from the implementation of the project entitled "An Integrated System for Wastewater management in Wadi AlArroub" funded by the Spanish Agency for International Cooperation and Development through which: (1) the civil works and structures of a suitable and top of the art wastewater treatment plant were established on land purchased and donated to the project by Sair Municipality; (2) the awareness of the stakeholders towards the importance of wastewater treatment and reuse was raised; and (3) the willingness of the resource-poor farmers to reuse treated wastewater in irrigating fodder crops and nut fruit trees was increased.

The major target group are the 150 resource-poor farmer households with small (0,1-0,5 ha) to medium sized (0,5-1,5ha) land holdings in Wadi Al-Aroub. Two town-hall meetings were held with the farmers. Most farmers attending the meeting expressed willingness to pay for and reuse treated wastewater in agriculture. However, the farmers lack the financial capital to invest and experience to select proper crops and optimize water productivity. Most farmers agreed to 30% cost sharing of in-farm water network and willingness to pay up to 0,31 EURO/m³ of treated wastewater.

Methodologically, the project includes three (3) working packages (WP):

WP1: Reduction of Plant Operational Cost

The objective of this WP is to demonstrate the feasibility of reducing the operational costs of wastewater treatment using innovative and cost-efficient technologies of energy production and sludge management

The expected results – **Outputs** are the following:

- Op 1.1. (related to Oc 1): Generating 50% of WWTP energy requirements at a fraction (37,5%) of the retail cost of electricity
- Op 1.2. (related to Oc 1): Reduce the current cost of sludge management by at least 80% through composting and marketing of good quality composted sludge



- Op 1.3. (related to Oc 1): Reducing the average cost of wastewater treatment from 0,4 EUR/m³ to 0,2 EUR/m³
- Op 1.4. (related to Oc 1): Protection of the environment by conversion of destabilized sludge into a marketable product that can be safely used to improve the physical and chemical characteristics of soils in rangelands and croplands

WP2: Innovative irrigation and nutrient management practices

The objectives of this WP is to gain economic advantages for farmers by introducing innovative irrigation practices and nutrient management that enhance water productivity while also reducing environmental burdens; increase the sense of ownership of the local community in the water resource by transferring to them the ownership; promote the sustainable operation of the WWT plant by recovering some of the O&M costs from the sakes of the TWW.

The expected results – **Outputs** are the following:

- Op 2.1. (related to Oc 2): A cost-saving and water efficient irrigation system is installed and operational
- Op 2.2. (related to Oc 2): Economic water productivity is increased by at least 25% from increases in water use efficiency, reductions in the cost of agricultural inputs.
- Op 2.3. (related to Oc 2): 7.7ha of land rehabilitated and reclaimed for agriculture
- Op 2.4. (related to Oc 2): 7,400 tons/yr of 12% by moisture hay and 54.6 tons/year of dry nut fruits produced
- Op 2.5. (related to Oc 2): Transfer of ownership and management of the water reuse scheme to the local agricultural cooperative

Work Package 3: Develop enterprises capacities to manage the reuse of treated wastewater and sludge

The objectives of this work package are: (1) enhance organizational, technical, financial and business capacities of the local agricultural cooperative qualifying it to manage treated wastewater distribution and reuse scheme; (2) develop the capacity of the sludge-composting facility operator to manage the dewatering and composting facility.

The expected results – **Outputs** are:

- Op 3.1. (related to Oc 3): The sustainable operation and maintenance of the dewatering and composting facilities
- Op 3.2. (related to Oc 3): The quality of compost in terms of its pathogen loads, chemical and structural properties is maintained after the transition of ownership
- Op 3.3. (related to Oc 3): The sustainable operation and maintenance of the irrigation infrastructure
- Op 3.4. (related to Oc 3): Maintain the economic and water use efficiency of the treated wastewater

Work Package 4: Supply chain management, quality standards, and product marketability

The objective of this work package is to improve the quality, pricing and marketability of agricultural commodities and compost. This will be achieved by helping resource-poor farmers achieve the full



potential benefits of sound agro-ecology practices and by empower the agricultural cooperative to improve the pricing, and marketability of agricultural products.

The expected results – **Outputs** are:

- Op 4.1. (related to Oc 4): Increase resource-poor farmer profitability from sales of better quality agricultural products to consumer cooperatives and fair trade organizations
- Op 4.2. (related to Oc 4): Increase market demand for the sludge compost

1.2.4.2 *Progress in brief*

In March 2017, the project team started to implement the project activities. The project is planned to be implemented, between March 2017 and February 2020, however a time extension should be considered as almost certain, due to delays on some core activities.

During the first period of the project's lifespan, the project's team succeeded in implementing part of the planned activities associated with the Work Package (WP) 1. A 1.1.1 "Reduction of Plant Operational Cost". This WP aims to demonstrate the feasibility of reducing the operational costs of wastewater treatment using innovative and cost-efficient technologies of energy production and sludge management.

The completed activities included:

1. Formulation of project steering committee;
2. Conducting the environmental impacts assessment (EIA) study for dewatering-sludge and composting facility;
3. Finalizing the Sludge Dewatering technologies study, which included:
 - a. Carrying out a comparison study of sludge dewatering technologies and composting facility covering both technical and financial aspects
 - b. Development of the engineering designs related to sewage sludge dewatering system;
 - c. Preparation of the composting facility design and relative technical specifications;
 - d. Design of the solar power special condition and relative technical specifications;
 - e. Identification of suitable locations for the different project interventions; and
 - f. Preparation of the Solar system tender documents.

The above activities are considered the basis of the work upon which the other project activities build.

Accordingly and based on the result of the above-mentioned activities, the project team worked on activities which are related to Facilities civil works, mechanical works, and equipment. In particular:

- a. Procurement of Sludge Dewatering equipment,
- b. Procurement of Sludge composting equipment, and
- c. Land purchase.

These activities resulted in developing the required data and information needed to demonstrate the feasibility of reducing the operational costs of using innovative and cost efficient technologies of energy production and sludge management.



However, the following activities, were not conducted due to several technical and logistic issues mainly related to the Land purchase activity:

- Sludge dewatering excavations and civil works,
- Compost facility land preparation and civil/mechanical works,
- Operation of sludge dewatering and compost facility

Furthermore, the project team had carried out an experimental design to increase water use efficiencies, irrigation scheduling, and nutrient application rates. Four crops were planted namely: 1) alfalfa, 2) almond trees (3 varieties), 3) pomegranates (2 varieties); and 4) grape vines.

As regards to the development of the capacities of stakeholders to manage the reuse of treated wastewater, two introductory meetings and a field visit for the farmers to tour the agricultural landscapes managed by the Good Land Agricultural Cooperative were conducted.

1.2.4.3 *Progress detail*

The first result of the project focused on demonstrating the feasibility of reducing the operational costs of WWT using innovative and cost-efficient technologies of energy production and sludge management. Accordingly, the related work to achieve the outputs namely: Op 1.1. Generating 50% of WWTP energy requirements at a fraction (37.5%) of the retail cost of electricity, Op 1.2. Reduce the current cost of sludge management by at least 80% through composting and marketing of good quality composted sludge, has been carried out by the project team.

Project cost efficiencies and actual financial cash flow reports for the PV system and the WWTP are developed based on the study's results of:

1. Comparison study of sludge dewatering technologies and composting facility covering both technical and financial aspects,
2. The engineering designs related to the dewatering system, 3) composting facility design and the technical specifications,
3. Design the solar power special condition and the technical specifications, and
4. Identification of suitable locations for the different project interventions,
5. Environmental impacts assessment (EIA) studies for the planned sludge thickener, sludge dewatering, composting facility and for the planned irrigation infrastructure.

Moreover, the project team managed to prepare the tender dossier for the PV system in accordance with the Palestinian Ministry of Local Government (MoLG) procedure, since MoLG will finance this component. MoLG will announce the tendering notice in the local newspaper after the logistics of the co-financing agreement (still under negotiation) is clearly defined and agreed on by the EU.

On the other hand, the project team prepared the sludge dewatering tender based on the EU PRAG version July 2015 and the above studies.

The project team had published the tender dossier of the sludge dewatering in the local newspaper.

As for Op 2.1. A cost-saving and water efficient irrigation system is installed and operational, the project team had collected the required information from the designed experimental where four crops were planted namely alfalfa, almond trees (3 varieties), pomegranates (2 varieties); and grape vines.



Working in the direction of capacity building of the Palestinian farms, two introductory workshops and a field visit for the farmers and agricultural extension agents to tour the agricultural landscapes managed by the Good Land Agricultural Cooperative was conducted. The visit aimed to demonstrate the different agricultural technologies utilized by the cooperatives such as the irrigation scheduling and subsurface drip irrigation system (SDI).

In regards to the community ownership, the project team had formulated the steering committee which is composed of PWA, MoA, MoLG, Popular Committee of Al-Aroub camp, and Sair municipality in order to assist the project team in facilitating communication with the local community; organization of the planned workshops; and providing contributions to the potential conflict management solutions using an adaptive management approach.

In general, some of the project activities in the reporting period had been implemented within the planned time, while others have been delayed due to the logistic issue related to the completion of the land purchase.

The project team considered the first project year to be the most challenging, because it forms the base for the entire project coming phases. So far multiple challenges were faced mainly related to logistic issues of the land parcel where the project interventions will be implemented. It is important to mention, that some actions are being implemented with some shift from what was set in the project original action plan, mainly resulted from the unexpected faced issue of land parcels procurement. This shift in some activities is planned to be implemented in the second year and part of the third year.

Picture 1-1: Road opened by Sa'eer Municipality leads to the targeted lands



Picture 1-2: Targeted land irrigated by the pilot small scale installed by ARIJ





Picture 1-3: Pomegranate irrigated by the treated wastewater in the pilot area



Picture 1-4: Site visit to the wastewater treatment plant and the targeted lands



1.2.4.4 Financial information

Implementation period of the contract (01/03/2017 – 28/02/2020)

Amounts in €

Budget Line	Total Budget	Year 1 Budget	Expenditures up to Feb18	% of Spend
Subtotal Human Resources	156.840,00	78.420,00	87.437,72	78.420
Subtotal Travel	7.200,00	3.600,00	3.891,84	3600
Subtotal Equipment and supplies	964.805,04	385.720,04	7.602,80	579.085
Subtotal Local office	2.400,00	1.200,00	1496,39	1200
Subtotal Other costs, services	14.400,00	4.050,00	2.636,18	10350
Subtotal Other	0,00			
Subtotal direct eligible costs of the Action	1.145.645,04	472.990,04	103.064,93	672.655,00
Indirect costs 7%	34.369,35	14.189,70	3.091,95	20.179,65
Total eligible costs of the Action, excluding reserve	1.180.014,39	487.179,74	106.156,88	692.834,65
Provision for contingency reserve	15.095,80	10.602,46	1.298,62	4.493,34
Total eligible costs	1.195.110,19	497.782,20	107.455,50	697.327,99



1.3 DEMO 3 (PARC): «INNOVATIVE DEMONSTRATIONS ON SUSTAINABLE INTEGRATED MANAGEMENT OF WASTEWATER AND RECLAIMED WATER USE IN NORTH WEST BANK»

1.3.1 General information

1. Project name:	Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank
2. Contracting party:	Agricultural Development Association (PARC)
3. Provisional duration	01/02/2017 – 31/01/2020
4. Overall objective:	To contribute to improving sustainable water and environment management through the promotion of sustainable and innovative wastewater management systems and reuse schemes in Palestine.
5. Specific objective:	<p>To create and disseminate innovative solutions in managing wastewater treatment and reuse in a sustainable, socio-economic manner, hence contributing in:</p> <ul style="list-style-type: none">■ The reduction of wastewater pollution on ground water;■ Improving food security conditions and access to non-conventional additional water resources for agricultural purposes in the targeted rural area
6. Target area:	Anin Village / Jenin Governorate
7. Target population:	<p>Anin Village residents of total population 4700 (2400 males and 2300 females)</p> <ul style="list-style-type: none">■ 800 rural families■ 50 small to middle size farmers■ Village council and joint service council■ Staff of PARC and Birzeit university■ School students■ Members of water user association■ Unemployed workers in Anin
8. Partners/ Beneficiaries:	PARC; Ecosan Club; Birzeit University – Institute of Environment and Water Studies; The Jordanian Hashemite Fund for Human Development (JOHUD)
9. Budget :	<p>€ 3.578.499</p> <p>80% EU contribution : € 2.862.799,20</p> <p>20% community contribution: € 715.699,80</p>



1.3.2 Background

Basic wastewater collection and reclamation is not available in most Palestinian cities and communities, who instead rely on septic tanks and cesspits. Septic systems generally provide for acceptable treatment and disposal of domestic wastewater in rural and low density communities. However, as communities grow and housing density increases, or in areas of rocky soil with poor infiltration, cesspit/septic system performance declines. Overall, these conditions typically lead to higher costs for the residents in terms of increased pumping and reduced protection of health and environment.

1.3.3 Overview of the project

1.3.3.1 *Introduction*

1.3.3.1.1 *Goal and objectives*

The objective of the project is to protect the environment through eliminating the cesspits that are currently used to dispose wastewater from Anin Village houses and replacing the cesspits with sewer network. Furthermore, securing new non-traditional source of water for agricultural irrigation through using treated wastewater for irrigating certain type of crops, which will in turn contribute to food security in the area. In addition, developing sustainable water and environmental management through the promotion of sustainable and innovative wastewater management systems and reuse schemes in Palestine.

The project consists of the following components:

- Design and construction of about 9 Km gravity sewer pipeline (main and service laterals) and all associated manholes and connection pits;
- Design and construction of wastewater treatment plant 'Sequencing Batch Reactors' (SBR) system;
- Installation of irrigation schemes for TWW use;
- Awareness and capacity building of the target groups including; farmers, school students, and technicians;
- Installation of solar panels;
- Providing institutional support to establish Water Users Association (WUA).

It is considered a "pilot" project because the goal is to demonstrate methods, which will maximize sustainable wastewater treatment in a small community setting.

1.3.3.1.2 *Partners & stakeholders*

The project is implemented by the following partners:

- **Palestinian Agricultural Development Association (PARC):** As the lead applicant, PARC handles the financial and administrative management of the project, internal project monitoring, ensuring smooth and effective coordination with partners and stakeholders, management of



subcontracts for technical design and procurement of works, supervision of works on site, selection of beneficiary farmers, design and implementation of reuse schemes, establishment and training of the Water User Association, awareness creation and capacity building, arrange the local external knowledge exchange visits, design & preparing the user-friendly dissemination and awareness publications, and prepare and participate in the Regional Dissemination Seminars.

- **Ecosan Club (ESC):** ESC is an Austrian NGO founded in 2002 by a group of experts active in research & development as well as planning & consultancy in the field of sanitation. ESC will prepare a detailed revision and approval of technical design of WWTP, including technical specifications; provide technical support during implementation of WWTP and collection systems (technical checks, approve submittals, revise and approve and modification or change in the design or specifications, scheduled and planned field visit to before, during and after constructing and operating the WWTP etc.); prepare operation and maintenance plan for WW system (technical & Financial); facilitate & arrange the external knowledge exchange visits; provide technical and institutional support for the establishment and training of the Water User Association, participate in the preparation of the tariff system for the WW system' participate in the design & preparing the user-friendly dissemination and awareness publications, and participate in the preparation for Regional Dissemination Seminars.
- **Birzeit University – Institute of Environment and Water Studies (BZU – IEWS):** BZU – IEWS will provide technical support during implementation, monitoring of treatment plant performance and reuse, develop part of Awareness creation and capacity building, Institutionalizing systematic training and support to operators of water and sanitation infrastructure, authorized and endorsed by PWA (Developing Training programs, Developing tariff system, etc), develop socio-economic and technical studies, setting up systematic quality control for the reuse (regular reclaimed water analysis, regular monitoring of reuse methods), sampling and monitoring of soil, plants and agricultural produce, participate in the design & preparing the user-friendly dissemination and awareness publications, and participate in the preparation for Regional Dissemination Seminars.
- **The Jordanian Hashemite Fund for Human Development (JOHUD):** It will participate in this project as an associate, and will be responsible for preparation and arrangement and facilitation of the exchange visits and training for staff that will be conducted in Jordan.

Involved stakeholders include the following:

- Ministry of Agriculture (MoA);
- Palestinian Water Authority (PWA);
- Local authorities and local groups: Representatives of farmers and women groups, Joint Services Council (JSC) and Anin Village Council



1.3.3.1.3 *Target area*

Map 1-3: Anin Village – Jenin Governorate – Map

Anin village at Jenin Governorate, has been selected as the target area, mainly for the following reasons:

- a. The potential for project overlap (from a future large-scale WWTP) is minimal as Anin village is an isolated community and relatively far from any neighbouring villages;
- b. The great majority of the households in the village can be connected to the sewer system without including any pumping and sewage water flows by gravity (almost 90% of household can be connected to gravity sewer system). From the design perspective, areas which can be served predominantly by gravity are easier to design, and as a result, are also cheaper to construct, operate, and maintain by minimizing the need for lift stations.
- c. The population density in Anin village is high. The denser the population, the easier and cheaper it is to connect more households to the sewer network.
- d. There is clear separation between the existing administrative structures, where in addition to the village council, there is a Joint Service Council (JSC) with an Engineering department. This JSC has previous experience in other public utilities and the necessary structure to manage them has been deemed more capable of performing successful future operations and maintenance requirements of the proposed WWTP.
- e. The readiness of the village council in the targeted village to provide the piece of land necessary for the construction of the treatment system.
- f. Possibility to have the piece of land for the treatment plant in zone A or B (Palestinian Authority has full civil control in both Areas A& B) to avoid possible delay that Israelis can cause for the implementation of the project.
- g. The location of proposed WWTP is adjacent to the sewer service area which will also reduce or eliminate the construction cost of sewer outfalls (gravity and/or pumped) and reduces the potential cost of maintaining the long sewer outfalls.
- h. The availability of agricultural land close to the treatment plant and readiness and willingness of farmers to reuse the treated effluent.
- i. Social acceptance and willingness of the community to collectively be engaged in agricultural reuse of reclaimed water.
- j. Increased agricultural water demand driven by lack of rainfall in Anin village that would also help to underpin the success of the project by simplifying reuse system design and operation.





1.3.3.1.4 *Project methodology*

In general, the project aims to:

- Protect the environment through eliminating the cesspits that are currently used to dispose wastewater from Anin Village houses and replacing the cesspits with sewer network;
- Secure new non-traditional source of water for agricultural irrigation through using treated wastewater for irrigating certain type of crops which will in turn contribute to food security in the area;
- Develop sustainable water and environmental management through the promotion of sustainable and innovative wastewater management systems and reuse schemes in Palestine.
- Utilize innovative treatment technologies that are suitable for the West Bank/Palestine;
- Utilize treatment technologies that are easy to operate and maintain, and minimize the amount of energy and water use;
- Achieve compliance with water quality and sludge quality requirements of the PWA;
- Produce an effluent that is of high quality and suitable for agricultural reuse;
- Provide wastewater treatment systems that are safe to operate, provide a good working environment, and have low risk of odors;
- Achieve the goals and objectives economically; including capital costs and O&M expenses.

The project has the following activities:

- Construction of wastewater collection system
- Construction of wastewater treatment plant
- Construction of irrigation scheme
- Capacity building component

Expected Results – Outputs are as follows:

- Management of rural wastewater and environment improved in a sustainable and socio-economic manner. Self-sufficiency of this pilot is achieved through use of appropriate treatment technologies, solar energy supplement, a structured and phased permitting plan, and synergy with reuse elements and energy supplement.
- Adaptation and resilience of rural farmers in targeted village to water related impact of climate change is enhanced, by promoting demand and access to additional water resources and irrigated area for agricultural purposes using reclaimed wastewater. Self-sufficiency, increased productivity and added value of this pilot are ensured through the use of appropriate irrigation technologies and well-structured Water Users Associations (WUA).
- Awareness, technical and institutional capacity of farmers groups, public service providers, and local and regional authorities is enhanced in the field of wastewater treatment and reuse.



1.3.3.2 *Progress in brief*

In the course of the reporting period, activities were carried out according to the methodological approach included in the project inception report (application).

Particular effort was given mainly in preparatory actions aiming at putting the foundation needed for the effective realization of the planned outputs.

Specific tasks carried out and results achieved in the reporting period are summarized as follows:

- Subcontracting the wastewater collection system;
- Subcontracting and initiation of the construction of 9 Km of sewer lines;
- Design of the WWTP in progress;
- Awareness campaigns inside Anin village with focus on school students

The following should be highlighted:

- Some activities are slightly behind schedule.
- There is a pressure and request from the community to expand the project by connecting all houses.
- The management team adjusted some parts of the design in order to reduce sewage network cost without affecting the integrity and efficiency of the sewage network..
- When the project was accepted by the EU, a 20% of the project's budget was assigned as financial community contribution. According to the director of Jenin West JSC this is too much and cannot be afforded by the community.
- As no risk analysis study was carried out before the start of the project, it is expected that when the wastewater treatment unit and the sewage pipelines network are constructed, then the project will be under risk. This risk is composed of two components: 1- not available funds to connect houses to the sewage network; 2- no estimation or calculation of the operating cost and cost of treated wastewater and hence no budget was allocated for the running cost of the project.

1.3.3.3 *Progress in detail*

Construction of wastewater collection system in Anin Village

The proposed project includes the construction of sewer system with all associated sewer pipelines, manholes, house connection pits required to connect about 60% of existing useholds within the defined Municipal Sewer Service Area. This system can be constructed without including any pumping and sewage water flows by gravity which is cheaper to construct, operate, and maintain by minimizing the need for lift stations.

- **Detailed design of wastewater collection system**

This task has been subcontracted based on EC guidelines on procurement procedures.

Results Obtained: detailed design of Anin wastewater collection system has been prepared by the Centre for Engineering and Planning (CEP). Detailed designs included drawings, bill of quantities, cost estimate, detailed profiles, and engineering plans. Gravity sewer lines were designed per PWA guidelines. Drop inlet manholes were provided when the vertical offset is greater than 0,6m. These limitations will reduce the silting in of the sewers and promote a longer



service life. The proposed system covers about 60% of existing houses with expansion capacity to serve the projected 20-year population. The proposed project work will be limited to within the main sewer lines and Anin will be responsible for the actual household connections.

- **Construction of 9 Km of sewer lines**

After preparing the complete tender ready package of Anin wastewater collection system according to EC regulations, the project was published in the local newspapers.

Results obtained: after tendering the project for the first time bid prices were higher than allocated budget for the project. In order to put the prices down the specifications of some material used changed (without affecting the quality and integrity of work) and about one Km of sewers with all associated manholes, service laterals and connection pits were eliminated. Afterwards, the project was tendered for the second time and the bid prices came lower but still higher than the allocated budget.

PARC has looked into other ways in order to save money including negotiating with the contractor in order to provide discount on the final bid price. The lowest price contractor and technically qualified offered 1% discount.

As the difference between the allocated budget of the project (900,000 euro) and the new bid price (1,210,818.51 euro) is equal to 310, 818, 51 euros, PARC is looking into the option of transferring money from budget line item (3.5.1 Design and Construction of Anin WWTP – 1,100,000 euros) to budget line item (3.6.2 Construction of 9 Km of sewer lines – 900,000 euros) noting that both are within same main budget heading.

Anin wastewater collection system has been awarded to Brothers Contracting Company based on the financial and technical evaluation of total contract amount of 1,210,818.51 euros.

The agreement with the contractor has been signed on April 22nd 2018. The project is currently under mobilization.

Construction of one centralized communal Wastewater Treatment Plant (WWTP)

A wastewater treatment plant (SBR system) will be constructed in Anin Village to meet several goals and objectives including: utilizing innovative treatment technologies that are suitable for the West Bank/Palestine, utilizing treatment technologies that are easy to operate and maintain, and minimize the amount of energy and water use, achieving compliance with water quality and sludge quality requirements of the PWA and producing an effluent that is of high quality and suitable for agricultural reuse.

The design of the WWTP is in progress. The plan was to prepare the design – build tender package. Due to the limited budget allocated and the fact that some amount will be transferred from the budget line item of the treatment plant to the wastewater collection system PARC is considering the approach of detailed designs instead of design – build as a better approach to achieve lower bid prices and to reduce the cost of supervision.

As Eco San organization has already prepared the conceptual designs of the wastewater treatment plant, it would be easier and faster to prepare the detailed designs and a full tender ready package. The construction of the WWTP will be overlapping with the construction of the wastewater collection system and both components are expected to end at the same time.



Results Obtained: when completed an innovative solution in managing wastewater treatment and reuse in a sustainable socio-economic manner will be achieved thereby contributing to reduce wastewater pollution, improve food security conditions and ensure access to non-conventional additional water resources for agricultural purposes in the targeted rural area in West Bank -Palestine.

Conducting four (4) awareness campaigns inside village with focus on school students

In order to increase school students' awareness about water and wastewater, awareness campaigns have been conducted in four schools in Anin village. These campaigns included lectures, workshops, demonstrations and field work targeted school students. The environmental awareness campaigns aimed at promoting awareness raising and building capacity in diverse water and sanitation fields and ensure the sustainability of planned WWTP and reuse facilities.

Results obtained: awareness campaigns were conducted in the following schools in Anin:

- Anin Elementary Girls School
- Anin Secondary Boys School
- Anin Secondary Girls School
- Mohamad Irsheed Yaseen Boys Elementary School

This activity was coordinated with the Ministry of Higher Education. The Ministry has reviewed the training material prepared by IEWS-BZU and coordinated with the trainers to deliver their training over 10 days between March and April 2018.

Picture 1-5: Photos taken during the site's visit.





Picture 1-6: Part of the land that will benefit from the project



Picture 1-7: Photos from part of the road that is covered by the sewage network, accomplished work







Picture 1-8: Photos from part of the road that is covered by the sewage network, accomplished work





1.3.3.4 Financial information

Implementation period of the contract (01/02/2017 – 31/01/2020)

Amounts in €

Budget Line	Total Budget	Community Contribution	EU Contribution	Expenditures up to Feb18	% of Spend
Subtotal Human Resources	356.445		356.445		
Subtotal Travel	50.800		50.800		
Subtotal Equipment and supplies	2.799.500	652.687	2.146.813		
Subtotal Local office	18.000		18.000		
Subtotal Other costs, services	88.680	10.000	78.680		
Subtotal Other					
Subtotal direct eligible costs of the Action	3.313.425				
Indirect costs 6%	198.805,50	39.759,43	159.046,07		
Total eligible costs of the Action, excluding reserve	3.512.230,5				
Provision for contingency reserve	66.268,50				
Total eligible costs	3.578.499,00	715.699,80	2.862.799,20	N/A	N/A



2. EVALUATION METHOD AND MAIN METHODOLOGICAL CONSIDERATIONS

2.1 METHODOLOGY

The methodology developed for conducting the monitoring (mid-assessment) used quantitative and qualitative methods as complementary instruments, with respect to specific questions seeking to better understand the demo projects management and implementation processes, and the respective stakeholders' involvement and perspectives.

In line with the Commission's evaluation practice and guidelines, initially it was pursued a methodological approach combining the most appropriate elements from the two main categories of impact evaluations; the "theory-based impact evaluations" and the "counterfactual impact evaluations".

Due to absence of counterfactual data, the approach concentrated in theory-based impact evaluation models, with the objective to follow each step of the intervention logic identifying causal links and mechanisms of change, and ultimately answering the questions why and how an intervention works. This approach mainly produces a qualitative estimate of the impacts. It includes methods such as a literature review, interviews, surveys, and intervention logic analysis.

The evaluation team built intervention models for each of the examined demo projects, whilst being mindful of the above considerations. These models rely on logic, but also on quantification of the expected results where possible (on the basis of the projects' documents) and the achieved results (on the basis of monitoring data) where available.

The monitoring and evaluation of the demo projects was conducted from 4/9/2018 to 31/12/2018.

2.1.1 Desk research

The desk research was conducted through a rigorous review of various Demo Projects' documents: inception and implementation reports presenting planning of activities as included in implementation plans and progress reports, project's intervention logic reflected in the most recent log-frame; relative call for proposals, as well as the allocated resources and budget programming documents.

The focus was on results, but outcomes were also reviewed as a basis of the links that were established during the analysis. The objective was to determine clear links between input-output-result and tangible effects, which were further analysed in the analysis of contribution and impacts. This is why the evaluation team mostly considered the outputs/results that have direct effects.

The desk research was expanded also to other relevant documents available on the internet and mentioned in the references chapter.

2.1.2 Field research

The field research was conducted using the following methods:



- Interviews
- Survey by using a specific questionnaire based on the proposed methodological DAC guidelines (see Annex 5.2)

The target groups were classified, as follows:

Target Groups	Demo 1	Demo 2	Demo 3
Contract managers	OM in the EUD	OM in the EUD	OM in the EUD
Implementing Partners/ Project coordinators	OXFAM	ARIJ	PARC
Project beneficiaries	<ul style="list-style-type: none"> - Palestinian Agricultural Development Association PARC - Palestinian Environmental Friends (PEF) - Oxfam Novib - Affiliated Entity to Oxfam Great Britain 	<ul style="list-style-type: none"> - Ministry of Local Government (MoLG) - Sair Municipality - Palestinian Water Authority (PWA) 	<ul style="list-style-type: none"> - Ecosan Club; - Birzeit University – Institute of Environment and Water Studies; - The Jordanian Hashemite Fund for Human Development
Project end-recipients⁴⁰	<ul style="list-style-type: none"> - People in the local communities, companies 	<ul style="list-style-type: none"> - Al Arroub refugee camp citizens - Sair town Citizens - Kwazeba village Citizens - Palestinian Farmers in Wadi Al Arroub 	<ul style="list-style-type: none"> - Anin Village residents - People in the local communities, companies
Indirect beneficiaries	<ul style="list-style-type: none"> - Coastal Municipal Water Unit (CMWU); - Ministry of Agriculture (MoA); - Ministry of Health (MoH); - Palestinian Water Authority (PWA); - Environmental Quality Authority (EQA). 	<ul style="list-style-type: none"> - Ministry of Local Government (MoLG) - Sair Municipality - Palestinian Water Authority (PWA) - Ministry Of Agriculture (MoA) - Popular Committee of Al - Aroub camp - Other related stakeholders such as Sair Civil Society Organization. 	<ul style="list-style-type: none"> - Ministry of Agriculture (MoA); - Palestinian Water Authority (PWA); - Local authorities and local groups: - Joint Services Council(JSC) - Anin Village Council

By combining both quantitative and qualitative data and using different types of applicable research methods, the results were triangulated, assuring their highest accuracy and validity.

The field survey was carried out by using the following tools:

⁴⁰ Projects' target groups.



Target Groups	Research Instruments
Contract managers	<ul style="list-style-type: none">One-to-one interview (Skype and / or telephone calls and/ or e-mail exchange)
Implementing Partners/ Project coordinators	<ul style="list-style-type: none">One-to-one interview (Skype and / or telephone calls and/ or e-mail exchange - face-to-face discussions)Questionnaire survey
Project beneficiaries	<ul style="list-style-type: none">One-to-one interviews (face-to-face discussions)Questionnaire survey
Project end-recipients	<ul style="list-style-type: none">One-to-one interviews (face-to-face discussions)
Indirect beneficiaries	<ul style="list-style-type: none">One-to-one interviews (face-to-face discussions)

Interviews were carried out with:

- The OM in the EUD to present the most significant preliminary findings from the discussions – contacts with the implementing partners, the problems encountered, the provisions built in and solutions adopted in the projects, as well as the proposed recommendations for further action.
- The implementing partners in order to confirm, refute or complete information already gathered on the project by the desk review and the reports shared by the projects' implementing partners
- Other stakeholders

The survey addressed mainly the implementing partners and was organised and implemented in parallel with the aforementioned interviews.

The field research tools are presented in the Annex of this report.

2.2 THEORY OF CHANGE UNDERLYING THE INTERVENTIONS

Theory of Change is essentially a comprehensive description and illustration of how and why a desired change is expected to happen in a particular context. It is focused in particular on mapping out or “filling in” what has been described as the “missing middle” between what a program - project or a certain policy does (its activities or interventions) and how these lead to achieving desired goals.

Starting from this definition, the evaluation team has reconstructed the Theory of Change behind the logic of the interventions of the three Demo Projects throughout the following steps:

- Identification of the problems that each demo project interventions were aimed to solve;
- Identification of the aims and objectives of the interventions;
- Identification of the envisaged interventions;
- Identification of the expected impacts;



- Identification of contextual factors that may have affected the implementation of the interventions.

Identification of the problems

This step has been performed by searching the available documents that indicate why it was believed necessary to plan and implement interventions at each Demo Project. The focus has been on the strategies as described in the various strategic documents and reports.

Identification of the aims and objectives of the interventions

The focus of the second step has been the long-term vision of the planned interventions and their final aims that are likely related to the needs identified during the previous step. Based on the Demo Project fiches, the major aims and objectives of the activities planned under the scope of this evaluation were identified.

Identification of the envisaged interventions

In order to address the above needs, the specific planned interventions were identified in the Demo Project documents and project contracts.

Identification of the expected impacts

In consideration of the aims and objectives of each Demo Project interventions and regarding the final aim (i.e. long-term impact) of the project, the anticipated impacts were identified by reviewing all relevant programming documents. At the same time, based on literature review, the main assumptions regarding the achievement of the anticipated impacts were identified.

Identification of contextual factors / assumptions that may have affected the implementation

The soundness regarding the theory of change relies on the context within which a desired change is expected to happen. Assumptions are made about the context within which interventions were/are implemented. Assumptions of this type involve beliefs about conditions that exist in the context/environment which are critical to the achievement of the final aim of the interventions.

Reconstruction of the theory of change underlying the interventions

Based on the above findings, the evaluation team reconstructed the logical cause-and-effect relations between activities envisaged within the programming documents and the expected impacts for each Demo Project, as stated in the relevant project planning, also taking into consideration the factors which may affect implementation.

Important Note:

The ToC table should be read in conjunction to the logframe matrix of each project as provided by the implementing partners (see Annex).



Figure 2-1: Reconstructed logic of intervention for Demo 1 (OXFAM)

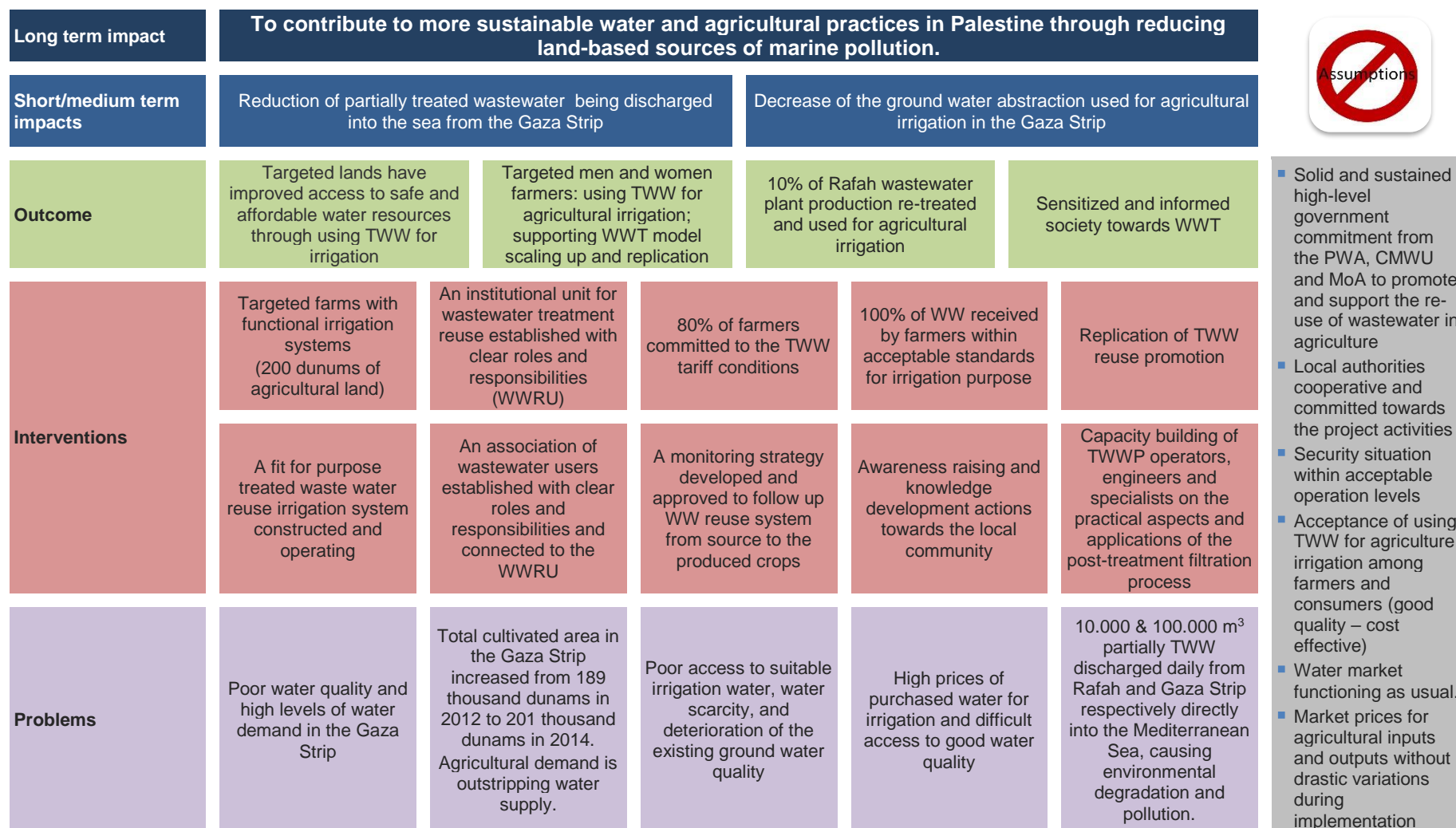




Figure 2-2: Reconstructed logic of intervention for Demo 2 (ARIJ)





Figure 2-3: Reconstructed logic of intervention for Demo 3 (PARC)





3. FINDINGS BY EVALUATION CRITERION

This section presents the findings of the mid-term assessment under the evaluation criteria of relevance; efficiency; effectiveness; impact and sustainability, and for the evaluation questions included under each criterion.

The analysis of the findings is linked to the reconstructed Theory of Change behind the logic of the interventions of the three Demo Projects. Moreover, the identification of the needs; of the aims and objectives of the interventions; and of the expected impacts, performed through the analysis of the relative documents and the analysis of the findings of the interviews and the surveys carried out in the course of the field phase of the assessment.

3.1 RELEVANCE

The correlation (relevance) of the strategy to the identified needs was analysed in relation to the identification of the problems depicted in Theory of Change and contained in the various EU and national strategic and/ or working documents.



3.1.1 Analysis

3.1.1.1 *Appropriateness of the objectives⁴¹*

Q.1. To what extent have the objectives of the Demo Projects interventions proven to have been appropriate for the needs of the water sector and the local society? To what extent did the projects prove relevant to address said needs?

Generally, the relevance of the Demo projects objectives is very high in relation to covering the needs of the water sector in Palestine as well as the needs of the local society that each project addresses. In addition, the three demo projects are in line with the objectives of the PWA.

Significant effort has been deployed in response to the objectives of improving water efficiency and promotion of the utilization of non-conventional water resources (in particular recycled and reclaimed water), as well as enhancing the employment and/or living standards of vulnerable groups.

A closer examination of the needs stated in various studies and related surveys, as well as of the corresponding objectives as they appear in all three-project fiches, reveals that all envisaged interventions clearly respond to the identified needs:

- Sustainable water and agricultural practices launched in Palestine through reducing land-based sources of marine pollution;

⁴¹ See Annex 6.1



- Job opportunities creation;
- Local companies' competitiveness enhancement;
- Water efficiency increase;
- Resilience to climate change enhancement;
- Local economy stimulation;
- Sustainable use of local resources promotion;

All needs are addressed by the projects including:

- Design and development of infrastructure;
- Public engagement, awareness raising and knowledge development;
- Learning and knowledge sharing.

In addition:

- The methodological approach used in the three projects incorporates the needs and concerns of key stakeholders and local communities
- The design of the related actions incorporates key issues of environmental and institutional sustainability of water as a public good and at the same time aims to achieve sustainable implementation of innovative approaches

Q.2. How relevant are the Demo Projects to the objectives and priorities set by the Contracting Authority?

All three Demo Projects in principle address a clearly identified priority problem, through an innovative solution that presents interesting potential for replication and positive impact on water management and pollution prevention / reduction in the target area.

Objectives and priorities set by the Contracting Authority are addressed well, therefore the relevance is considered good.

Further analysis is given in Annex 5.1.

Q.3. Is the intervention logic clear? Is the logical framework suitable for monitoring purposes? To what extent are the expected results and activities, assumptions and overall objectives still valid?

The projects' log-frames:

- are clear and suitable for monitoring purposes.
- include proper indicators and sources of verification.
- are updated but not significantly changed.

In all demo projects expected results and activities, assumptions and overall objectives are still valid.

Nevertheless, it has to be pointed out that modifications, some of them significant, were needed due to challenges that all projects faced. Indicatively:



Demo 1 (OXFAM):

- The most important change and challenge encountered in the first year of the project was the rejection of the AlShouka community as the target area of the project, due to the opposition of a small group of powerful farmers. This development led to an unexpected change in location to another community, namely the AlMawasi. The latter was identified as the most appropriate target land for the change in location, based on the PWA's feasibility study from 2016 and the rapid assessment conducted by Oxfam in March 2018.
- The location change has influenced other actions as well.
- It is expected that due to this change from Al Shouka to Al Mawasi, delays will occur but the main overall objective of this project is still valid. OXFAM and the project's steering committee work hard to compensate this delay.
- In order to make sure that the project will satisfy the needs of the new targeted location, Al Mawasi, a rapid needs assessment was successfully conducted.
- Oxfam claims that the project is achievable within the provisioned time framework.
- Last, the gender related indicators were updated to be more realistic concerning the results of the gender analysis study.

Demo 2 (ARIJ):

- Since the beginning of the project, ARIJ has insisted to involve all the beneficiaries and targeted groups and cooperate with them to share the ownership and experience and to facilitate the implementation of project's activities.
- All needs identified are still valid since sustainability of the wastewater treatment and reuse system is still a priority in addition to job creation and increasing food security and solving the pollution problem that people face in the targeted area.
- The project's activities are under implementation and construction according to the original plan. Therefore the expected results, activities and assumptions and overall objectives are still valid. Since the start of the project, no regulation, laws or other needs arose.
- Due to the problem of buying the parcel land, there was some delay that forced the project steering committee to look for another land nearby the existing wastewater treatment plant. As a result of the need to purchase different land from the one at which the baseline design was carried out, some modification within the scope of the project was carried out. This includes a need to have storage tank for the treated wastewater.
- All project's objectives and implementation activities are known and accepted by all parties including stakeholders and beneficiaries.
- What is achieved on ground until now is according to the planned framework. The outcomes of the project are known and clear to all stakeholders and beneficiaries. The project responds to the needs of the target area and it is in line with the PWA strategy to treat wastewater for reuse in irrigation.
- The project includes the implementation of both civil and electromechanical works and ARIJ faced difficulty to define accurately – with detail the proposal; specially that the site of implementation also is part of project outcome and result of local market available offers and



not precisely ideal engineers selected site. Task that made variations between the baseline survey design, cost estimates, and final design needs, as consequence affecting intervention costs. Specially that final adopted site of intervention is not necessarily the planned to have (as result of land market availability and limited options for technical aspects needs).

- Activities have been updated in order to adapt to changes that have occurred over the project's lifetime due to land purchase delays as consequence of autocratic processes which lead to domino effect in the implementation of the different interventions on those project purchased land parcels. All updated activities were sent to EU representative to get approval.
- The project team had to do changes in the items that will be covered by the co financing. While initially the Palestinian Ministry of Local Government committed itself to finance the Solar System of the Wadi al Aurb Wastewater Treatment Plant, it (the MoLG) requested to switch the co-financing from the solar system component to the infrastructure expenses. The reason behind this change is that MoLG could not allocate the budget in the 2017/2018 fiscal year and their willingness to have the solar system as soon as possible to reduce the electricity bill.
- A risk analysis was not carried out before the project was implemented. This is recognized as a significant issue.
- ARIJ already installed a small pilot project in a land nearby the project area where the beneficiary farmers make use of the treated wastewater in irrigated small area cultivated by the farmers. Therefore, the farmers have strong trust that the project will achieve its objectives and fulfil their needs. Until now there is no idea about the operating and running cost of the projects once it commences.

Demo 3 (PARC):

- Activities are under implementation and construction according to the original plan. Therefore, expected results and activities and assumptions and overall objectives are still valid. Since the start of the project, no regulation, laws or other needs have arisen.
- The project still responds to the beneficiaries' needs; there is a pressure and request from the community to expand the project by connecting all houses and not only the provisioned 65% of houses.
- The management team adjusted some parts of the design in order to reduce sewage network cost without affecting the integrity and efficiency of the sewage network. All project's objectives and implementation activities are known and accepted by all parties, including stakeholders and beneficiaries. What is achieved on ground until now is according to the planned framework. The outcomes of the project are known and clear to all stakeholders and beneficiaries. The project is still respond to the need of the target area and it is in line with the PWA strategy to treat wastewater for reuse in irrigation.
- The project started with no sustainability desk study. Even in the implementation period, it started with not enough funds. When the project was accepted by the EU, a 20% of the projects budget was assigned as financial community contribution. According to the director of Jenin West JSC this is too much and can't be afforded by the community.
- As no risk analysis study was carried out before the start of the project, it is expected that when the WWT unit and the sewage pipelines network are constructed, then the project will be under



risk. This risk is composed of two components: 1- not available funds to connect houses to the sewage network; 2- no estimation or calculation of the operating cost and cost of treated wastewater and hence no budget was allocated for the running cost of the project.

Q.4. Have changes occurred in the projects' environment since the start (e.g. regulations/laws/ other needs) that have positively or negatively affected the relevance of the projects?

Besides the particularities of the external environment due to the complex political conditions, there have been no worth mentioning changes in all three projects environment.

3.1.1.2 *Complementarity*

Q.5. To what extent do the demo projects interventions complement regional, national, EU strategies / programmes and other assistance present in Palestine?

As previously mentioned, all projects' interventions complement regional, national and EU strategies as regards to addressing challenges of the water sector in Palestine;

Indicatively:

- Development of alternative resources programs: Due to the scarcity of water and the limitation to the access to conventional water resources for reasons that have been analysed earlier in this document, the emphasis on the development of alternative resources is one of the possible solutions for acquiring extra water quantities. Even though these quantities are small and cannot cover the deficit stemming from the increasing demand, the focus on these resources in the coming years such as the treatment of wastewater and others will contribute to meet some of the water needs of the Palestinian society and other various developmental sectors.
- Capacity building: All three projects highlight the importance of participation in planning, operation and management of the water resources and invest in fostering relative competences to people involved.
- A relation to the MoA Agricultural Strategy's key objective of 'effectively and sustainably managing agricultural resources' is clear. Moreover, the projects are linked with the PWA's National Water Policy

As regards to complementarity:

- In the Demo 1 (OXFAM) project OXFAM with the help of UNDP and JICA secure a fund for the construction of the solar panel that will provide the electricity needed to run the wastewater treatment unit.
- The Demo 2 (ARIJ) project:
 - envisions the participation of the local agricultural cooperative, the local municipal council, representatives from the Palestinian Water Authority and the Palestinian Ministry of Agriculture;
 - builds on previous efforts that solved the pollution problem resulting from the open discharge of untreated domestic wastewater into Wadi Al-Aroub which was causing debilitating health problems.



- The Demo 3 (PARC) project:
 - builds on the results and learned lessons of a recent successful EC co-funded project (2011-2015) implemented by PARC, IEWS and EcoSan Club aimed to ensure access to additional water resources for agricultural purposes through the treatment of wastewater in a sustainable socio-economic manner;
 - is considered as a continuation of two projects funded by the EC between 2003 and 2007: (1) MEDWA project that was implemented by PARC, EcoSan Club, and JOHUD, (2) EMWATER project that was implemented by IEWS in the cadre of MEDA water program.

3.1.1.3 *Coherence*⁴²

Q.6. To what extent are the demo projects interventions coherent with other interventions implemented in Palestine which have similar objectives?

The following should be noted:

- The strategic coherence of the actions' objectives in relation to the Contracting Authority's priorities is high for all demo projects.
- Internal coherence of the interventions is appropriate, with projects planned in logical sequence and progressively.
- The external coherence, which was examined in relation with other interventions taken or taking place in Palestine, is appropriately addressed through clearly identified links with interventions in the fields of enhancing effectiveness of local water resources governance and promoting water demand management, water efficiency and non-conventional water.

3.1.2 Recommendations

- Enhance the scope of the call for proposals, increased focus on specific target groups and type of activities, and where appropriate introducing a territorial dimension.
- Provide for a greater participation of the private sector. The reasons typically given for projects turning to the private sector are a) to attract capital investment; b) to improve technical and managerial efficiency. Thus, it could be useful if the calls for proposals promoted the idea of having as an integrated part of the governance of the projects, the effective and efficient private sector involvement.
- Support the implementation of similar projects of larger scale, through wide-range grant schemes, including also support to increasing employment opportunities.
- Scalability is critical in terms of: a) larger projects (size and amount granted); b) projects of similar kind.
- As regards to projects of similar kind, consider also the option to design grant schemes allowing smaller entities to apply for grants, i.e. grant schemes with relatively small size of grants and a larger number of selected beneficiaries. This will allow multiplication of the benefits to a wider

⁴² See Annex 5.1



part of the population through a large number of small-medium size projects. However, regarding the application of this recommendation it is extremely important to consider the capacity to manage a large number of projects within a context of centralised management, or include the management of large-scale grant schemes under service contracts designed to that extent or as additional tasks within contracts providing for institutional and capacity building support.

- Social partners' active participation at all levels of implementation is highly recommended.

Regarding the complementarity of demo projects to other strategies/ programs etc:

- To develop a strategy and action plan, containing clear targets and links to other strategies ie employment strategy etc.

Regarding the coherence of the demo projects with other interventions taking place in Palestine:

- To improve coordination with other donors / NGOs through increased consultations and capacity building in funds' coordination.

3.2 EFFICIENCY

Efficiency is considered by the evaluation in the context of;

- the timeliness of the delivery of inputs (both human and financial resources),
- the appropriateness of the implementation modalities (i.e. the management framework in terms of quality - reliability and clarity, competence, suitability and effectiveness and the quality of the arrangements for monitoring and evaluation) and
- the quality of the implementation as contributing factors in determining whether value for money was achieved in the delivery of the foreseen interventions.



3.2.1 Analysis

3.2.1.1 Projects

Q.7. To what extent was the call for proposals appropriately designed to lead to the selection of good quality projects? To what extent was the size and duration of projects appropriate for achievement of expected results?

&

Q.8. To what extent have the selected projects been designed to deliver impacts and benefits? What could be improved for a prospective future call?

The provisional duration of the projects is anticipated to last more than what was initially designed; this will be remedied, by extensions and contract addendums. However, this is a general issue of the overall EU programming and not particularly linked to the water sector.



Allowing for the realistic necessary involvement of various actors would necessitate longer project duration, especially when taking into account the particularities of the region.

Another issue, which has been brought to the attention of the monitoring team by stakeholders, is the overambitious expectations of the projects' terms of reference, not so much in regards to the quantitative targets, but in reference to the expected time consumption.

The envisaged interventions are sometimes difficult to follow the initial design. For example, the Demo 2 (ARIJ) project while preparing the proposal had to include the implementation of both civil and electromechanical works and faced difficulty to define accurately the respective needs from the beginning. This is normal when considering that the site of implementation is also part of the project outcome and the result of local market available offers and depends heavily on the selected site. This task resulted in variations between the baseline survey design, cost estimates and final design needs. As a consequence this affected intervention costs, especially taking into account that the final adopted site of intervention was not necessarily the planned to have (as result of land market availability and limited options for technical aspects needs).

For almost all of the projects, it was mentioned that: *"Projects in Palestine having to do with such sensitive issues take time"; "we had to wait for the approval, the necessary issues to be settled... before we could advance with the project activities"*.

Regarding the quality of the call for proposals for grants, it is generally very positive, although there is room for improvement. The global and specific objectives could be further linked to the expected results. Focus should be given on the intended change and have a clear vertical logic. The clarity of the objectives is not just a matter of formulation. Clearer objectives would bring more focused activities and would allow for better monitoring and evaluation of the expected results. Moreover, projects' design should include clear and realistic indicators of achievement.

Other areas of improvement are:

- Consider the territorial distribution, particularly for regions with specific characteristics linked to particular economic sectors or to demographic factors;
- Further inclusion of employers and their associations.

Regarding the size of the grants, it is to be noted that the option of a small number of grants of relatively important amount, may not be a guarantee of effective project implementation. On one hand, grants are distributed to a small number of beneficiaries preventing other, smaller entities, from gaining experience and expertise in the implementation of similar projects. On the other hand, the duration allocated for the implementation of grants of important amounts may prove insufficient for the appropriate absorption of the funds in quality activities. It is therefore recommended to reconsider the grant distribution mode, by either introducing grant schemes allowing for small and medium-size projects by a larger number of beneficiaries or, as previously stated, by supporting the implementation of similar projects of larger scale, through wide-range grant schemes.

3.2.1.2 *Implementing partners & Beneficiaries*

Q.9. To what extent do the project implementing partners & beneficiaries have the necessary capacity (technical and financial) to promote and implement the envisaged interventions?



As a point of departure for this assessment it should be recognized, that at the beneficiaries' level there is sufficient capacity carrying out the foreseen activities, particularly at the level of the main implementing partners.

The following should be taken into account:

- Initial projects' design take into account the complimentary expertise and experience brought by different actors.
- In most cases, implementing partners and beneficiaries had previous collaboration experience, which is considered as a positive element. However, lack of local dynamics knowledge is also observed.

3.2.1.3 *Project management and monitoring system*

Q.10. Has a Project Management Board been set up and is it meeting regularly? Is an internal monitoring system in place, allowing cost-effective implementation of activities?

All projects include Steering & Technical Committees that review the actions' progress in an open forum, ensure mutual accountability among implementing partners and beneficiaries, provide guidelines for effective implementation of the envisaged interventions and discuss challenges and lessons learned. These bodies meet regularly; however, in some cases delays occur, having to do with the absence of some members, due to various reasons (ie members coming out of Palestine; etc).

Steering & Technical Committees include representatives from several ministries, the local communities targeted by the projects, as well as various stakeholders in the local committees.

Some critical issues are the following:

- Steering Committees sometimes lack flexibility in their operation due to their composition with high ranking officials;
- Technical Committees are more efficient since they work on the technical level;
- It should be stressed out that some problems have been pointed having to do with lack of clarity in the definition of the roles and responsibilities of the consortium members, especially in Demos 1 (OXFAM) and 3 (PARC). This affects somehow the performance of some partners and cause implementation delays. To this end, roles and responsibilities should be updated and discussed as regularly as possible to avoid surprises.

Q.11. Have the methods and tools used to monitor, collect data and report results been adequate?

In general, for all Demo projects, methods and tools used to monitor, collect data and report results have been adequate during the first year. In particular:

Demo 1 (OXFAM):

Among the methods and tools used by OXFAM to monitor, collect data and report results are:

- Base line survey and report;
- Rapid needs assessment;



- Field workers from all partners continuously make feedback on their field visits;
- Feedback mechanism of OXFAM, hotline and online application on tablets;
- Progress meetings between partners and communities;
- Monthly narrative updates;
- Carrying out questionnaires and cross checks methods.

It should be stressed out that representatives from all stakeholders and project partners are taking part in the Steering Committee and its regular meetings, to discuss the project challenges and progress. In the first year of the project, 5 meetings were held following the establishment of the Steering Committee in September 2017.

In addition, two main mechanisms will be established to ensure greater sustainability:

1. The entity that will be responsible of the process after the funding period will be the WasteWater Reuse Unit (WWRU), to be chaired by the Ministry of Agriculture. The WWRU is expected to be established in the second half of year 2 and its main role will be to take the responsibility of monitoring and following up on the production and the quality of the products, according to established;
2. The legal framework of the treated wastewater management is currently under review by the project partners. Once this framework is finalized, it will be presented to the members of the Steering Committee and community members in an official meeting, who have participated in consultation sessions and workshops to discuss its content. The legal framework will include elements related to the establishment and role of the WWRU.

Following the establishment of both the WWRU and the legal framework, it is expected that different stakeholders will work cooperatively to ensure high quality of products, satisfaction of farmers and monitoring of the treated wastewater for agriculture process, including the management of the tariffs system.

Demo 2 (ARIJ):

Among the methods and tools used by ARIJ to monitor, collect data and report results are :

- Direct field survey (ARIJ Staff and/ or Hired);
- Internal monitoring system;
- The use of software and other tools, corresponding field expertise, Geographic Information System (GIS) software, ARIJ Satellite Images, ARIJ database, Excel Sheets ,SPSS, GPS , etc. all depending on the type of data required to be collected.

Demo 3 (PARC):

PARC has developed monitoring, evaluation, accountability and learning (MEAL) during the inception period to ensure the action's efficiency and effectiveness.

Key elements of the monitoring and evaluation framework include:

- Project Steering Committee meetings meet every six months to discuss progress against agreed upon activities, and any significant changes in the external environment that may impact upon this action. It consists of senior staff from PARC and its partner organizations and high level representatives of the PWA, MoA, EQA and MoLG.



- Local Project Committees and field visits to ensure that beneficiaries participate in monitoring and provide suggestions to improve delivery of activities. This inclusion will encourage participating beneficiaries to take ownership, learn from the action and to suggest new interventions.
- Stakeholder Meeting is held every six months, to which international and national organizations interested (for example, PWA, MoA, EU) are invited to ensure coordination and exchange of lessons learned.
- PARC prepares and submits regular progress technical and financial reports, which measures progress against agreed benchmarks and ensures that project spending is in line with the proposed budget.
- Expenditure verification (Auditing) takes place on an annual basis.
- An internal mid-term evaluation takes place to ensure project strategies remain appropriate and that this action is on track to meet all targeted outputs, outcomes, and results by the end of the action.
- A final evaluation conducted at the end of this action, in which the EC will be invited to participate.
- PARC utilizes the expertise of local evaluation firms in ensuring that the most qualified organization is selected to conduct an independent evaluation of program progress and impact.

Q.12. Are the demo projects progressing on time, as planned and within the budget? Has the budget for the projects been adjusted and if so why?

Some delays in accomplishing activities are foreseen which may put the projects under risk of being accomplished on time; this could have been managed if a thorough risk assessment was carried out beforehand. Demo project 2 and demo project 3 will require time extension to accomplish the objectives. Within the course of implementation for all three-demo projects there was a necessity to differentiate activities, either in terms of budget, scope or even both, without however altering the final output.

In particular:

Demo 1 (OXFAM):

- There will be a delay due to importation of material from siege the Gaza Strip. As this will need to advance coordinate with the Authorities to get clearance and bring the materials used in construction, may lead to delay in finishing the respective construction work at the planned date.
- Total budget did not change. Some reallocation of budget between different budget lines was needed. Also, the € 97.000 allocated as contingencies, was transferred recently to the project budget in order to cover all unexpected activities such as the sand filter and the post treatment unit. .

Demo 2 (ARIJ):

- The budget has been adjusted mainly due to the following :
 - Technical different land parcel civil works needs from original site that was assumed to be adopted at the project baseline survey phase, and that at the end was not possible to be purchased and adopted to serve project goals;



- During project implementation work was preceded with an intensive study of alternatives, task done previous the finalization of tender documents and designs and that resulted in necessary technical modifications, for multiple reasons: safety, produced compost quality; project sustainability.
- The realization of the above mentioned in most of cases includes more activities and works than the originally stated in the original proposal. These changes in the different budget lines were mostly summarized in shifts between budget lines and in the use of contingency.

Demo 3 (PARC):

- The budget of the project was underestimated. It is expected that there will be a deficit of budget on some activities, therefore the technical committee is studying the cancellation of “less important activities” such as staff travels and other desk studies and transfer their budget to other urgent and underestimated activities to make sure that this transfer will result in accomplishing the project. This transfer will be carried out on condition that it will not have negative effects on project’s outcomes.
- Therefore, currently, PARC in the process of restructuring project budget which includes reallocating and shifting amounts from one budget line item to another in order to cover up for the budget deficit for some line items.
- Another important issue is that community financial contribution is still not paid in cash. EU agreed on the commitment provided by several governmental authorities to cover parts of community contribution.
- PWA will cover all houses connection expenses to the main sewage network, MoA will provide seedlings, Ministry of Works will pave the road leading to the wastewater unit and Energy authority will cover the expenses of solar panels. Any delay or break in these commitments is a risk to the project as it will result to not being able to complete the project and hence not treating wastewater.
- Disbursement of funds is based on making payment when an activity finishes. Unfortunately, international payment to cover consultancy works carried out by Eco San is not done due to some bureaucrat procedure.
- Project coordinator and field engineer monitor activities under implementation and do modifications needed in order to reduce cost but without reduction of project’s quality. Members of technical and steering committees are informed on any corrective measures taken.

Q.13. Would it have been possible to organise actions/ implement interventions in a better way and, perhaps, more efficient?

All demo partners declare practically that there are not actions that could have been implemented differently, in a better way and, perhaps, more efficient. By stating this, they actually imply that: a) working in a very complex environment, they did not do something wrong; b) all adjustments, modifications, changes to the context of the projects were due to external factors. So to cope with this, at the closure of the projects, all partners should be requested to provide recommendations on how they would have drafted differently the call that guided the drafting and design of their work plan, which at certain points had to be revised.



3.2.1.4 *Projects' design*

Q.14. To what extent is the size, design and duration of projects appropriate for achievement of expected results? What could be improved?

The size and design of the projects seem to be appropriate for the achievement of the expected results, although all projects are still in a pre-mature implementation phase.

As pointed above some delays could be considered as almost certain, specially for Demo projects 2 (ARIJ) and 3 (PARC).

An inherent problem worth mentioning on the design of the demo projects is that they all came as a response to an EU call for proposals, therefore they all had to address specific needs and try to satisfy certain criteria mentioned in the terms of references. This process sometimes lead to the design of projects trying to satisfy generic criteria instead of trying to satisfy actual needs.

In addition, the overall process does not allow for a significant preparatory work among EU and the interested parties. EU is obliged to select projects for funding based on submitted applications and does not have the ability to discuss several issues beforehand. Thus, it is not possible for EU to address issues of interest before entering into contracts with beneficiaries. This fact may limit somehow the scalability and replicability advancement in the most effective and efficient way possible.

To this end, a thorough risk analysis should be requested if not at the proposals phase, at the very beginning of the projects (it is after all understandable that project promoters cannot take into account beforehand all aspects needed for the implementation of the proposed interventions).

Last, it should be noted that in terms of efficiency of the demo projects' interventions and in relation to their design, it is clear that without sufficient support on behalf of the main government organisations, it is difficult to reach the intended impacts.

3.2.1.5 *Stakeholders*

Q.15. To what extent have the Demo Projects contributed or are likely to contribute to building the capacity of the stakeholders?

- The effects are considerable at the level of the beneficiaries in all demo projects and in the sector of WWT.
- The effects at the level of Ministries are difficult to discern, at least for the time being. That said, staff of the authorities has limited involvement in the management of the projects. In addition, sometimes, there is lack of understanding of the demands of leading a change and how to secure systematic evidence based decision making, action planning and regular monitoring.
- Nevertheless, there is a wide acknowledgment of the contribution of the demo projects in building sustainable capacity of the stakeholders not only in implementing projects, but in the entire project cycle including strategy development and design of targeted interventions along with the EU policies as depicted in the respective call.
- There is also a growing understanding at executive level of the needs for developing realistic action plans for the implementation of the envisaged interventions and a proper monitoring framework. As well as the need of taking leadership.



3.2.2 Recommendations

- There are opportunities for improvement in terms of designing more targeted interventions in consideration of the needs of the water sector and the target groups.
- There are a few good practices worth taking on board for the future programming, but also some opportunities for maximising the projects' results through improved design and implementation of the interventions:
 - Risk analysis should be conducted at the beginning of all projects;
 - Consistent efforts for awareness raising, implemented since the very beginning of the projects, are considered essential;
 - Conducting awareness sessions and workshops dedicated on the safe use of TWW should be held on a regular basis by the Government and local authorities.
- Project management systems and procedures should be strengthened in order to avoid shortcomings in the decision making process.
- Attention should be paid to the design of the projects in consideration of the capacity of the stakeholders, which in some cases is limited.
- Stakeholders analysis is considered a critical success factor and should be conducted at the beginning of projects (ideally it would be useful beforehand).
- Steering Committees should be formed to be as flexible as possible.
- Keep all partners informed about all activities and difficulties faced during the implementation of a project. When it comes to any milestone activity or decision, it is necessary to record it in minutes of meeting where all partners have a copy of it.

3.3 EFFECTIVENESS TO DATE

Effectiveness examines the extent to which the interventions implemented have led to the intended change to the beneficiaries. The evaluation considers whether planned results have been achieved, whether results delivered are used for the purposes intended and seeks to identify examples of negative factors in the achievement of the results. The quality of monitoring mechanisms and indicators are considered as a key factor in assessing performance. Another pivotal aspect of assessment is the achievement level of the expected changes.



Regarding the evaluation of the effectiveness, the monitoring team used information from the projects' documentation supplemented by the information gathered through interviews with the contract managers and the beneficiaries. The evaluation examines, among others, the planned intervention objectives' level of achievement. These are related to the needs identified in the strategic documents.

3.3.1 Analysis



3.3.1.1 *Achievement of the objectives*

Q.16. To what extent demo projects interventions have achieved/are achieving their main objectives? Have all planned outcomes been achieved to date?

&

Q.17. What are the immediate measurable results for the demo projects? If no results were achieved (or only partially) until now, what are the main reasons?

The achievements are not evaluated as project outcomes but viewed as progress/outcomes within a series of actions in a continuous process of planning. The perspective is focusing on impacts with a clear view to sustainability of the actions. That said, the following are noted:

- Overall, projects seem to be reaching their goals and objectives translating the project level outputs into results and impacts. However, it is considered early to assess the respective level.
- The fulfilment of some objectives could be questioned (if further actions not initially provisioned do not take place).
- All three-demo projects managed to convince the targeted populations of the benefits of reusing treated wastewater in irrigation.

Per project, the following are noted:

Demo 1 (OXFAM):

- Oxfam, and its local partners PEF and PARC made progress in implementing activities under the five Outputs during the reporting period.
- Specific tasks carried out and results achieved in the reporting period are summarized as follows:
 - Formation of successful partnership and synergies between Oxfam and government stakeholders such as the PWA, CMWU, MoA, and MoH through its local partners and the PSC;
 - Actions aiming to increase the acceptance of using TWW for agriculture irrigation among farmers and consumers;
 - Reallocation of the action from Al Shouka community to to Al Mawasi in Rafah Governorate, accompanied by successful mitigation measures undertaken by Oxfam and its partners;
 - Beginning of technical design and legal frameworks;
- Some activities are slightly behind schedule mainly due to the re-location of the action to Al Mawasi and other unexpected factors: delays in the tendering process for construction works; political conditions such as the closure of Beit Hanoun check point and inter conflict between Authorities in Ramallah and Gaza.
- The project is expected to achieve its results.

Demo 2 (ARIJ):

- ARIJ declares partially achievement of results, mainly due to delay in land purchase as consequence of bureaucratic procedures and governmental procedures gaps . Land purchase



faced delays and forced the working team to postpone works on the ground. Due to this, the tendering processes related to the implementation of project intervention works in those parcels, was postponed. Contractors tendering processes were Postponed, because contractors offers validity are linked to strict time frames .

- Delay in co-financing from the MoLG affected some of the activities in the ongoing plan. This forces ARIJ to ask for an extension in the implementation plan.
- Despite these delays, the project's activities are on track. The following activities were accomplished:
 - Conducting the environmental impacts assessment (EIA) study for dewatering-sludge and composting facility,
 - Finalizing the Sludge Dewatering technologies study, which included i) carrying out a comparison study of sludge dewatering technologies and composting facility covering both technical and financial aspects, ii) development of the engineering designs related to sewage sludge dewatering system, iii) preparation of the composting facility design and the technical specifications, iv) design the solar power special condition and the technical specifications, v) identification of suitable locations for the different project interventions, and vi) preparation of the tender documents for the Solar system and in advertising for its tendering. These activities have been considered the basis of the work upon which the other project activities will build.
- During project related activities, ARIJ worked hand in hand with the different Palestinian Ministries and even with direct follow up of the Palestinian Prime Minister. ARIJ is expecting soon governmental input to contribute in parallel to project set goals, e.g. expected government funds allocation for enhancing farmers access to the road and solving sewage collection network, which currently faced clogging problems.
- Despite that works on the ground are delayed, a lot of logistic work has taken place: preparation of tender documents and initiation of tendering processes are already set; soon once contractors win the tenders works will be heavily advance.
- Achievement degree is estimated to be around 50% despite the fact that works on ground are delayed.

Demo 3 (PARC):

- The wastewater collection system is under construction, the bidding for the construction of treatment plant is open for application by specialist companies, awareness and capacity building of the target groups including school students and farmers were carried out (500 school students have been trained; 15 farmers have been trained on the benefits of using treated wastewater to irrigate their crops).
- Achievement degree is estimated to be around 60% despite the delays.

Q.18. What have been the effects of demo projects' interventions in a) the water sector; b) the target population? To what extent do the observed effects correspond to the set objectives?



Assessing the effects of the quite substantial support to the water sector and the targeted populations in terms of the magnitude of projects, the importance of these projects and the funds spent, it is not surprising that there are notable effects on the level of end-recipients of the assistance, but also at the administrative level.

All in line with the set objectives of the EU and the national relative strategies and the terms of reference/technical specifications of the projects, implying that the objectives set were relevant and the implementation of the stipulated activities in general satisfactory. Despite the obstacles and partial 'fall-outs' during the first year, the total degree of engagement is satisfactory and much appreciated by both the beneficiaries and the targeted populations, evidenced by the evaluation interviews.

3.3.1.2 *Grant contribution*

Q.19. To what extent can the changes/effects be credited to the EU grant contribution

The EU interventions are not the only ones in the Palestine Water Sector and cannot be understood as such. Therefore, when assessing the extent, to which the observed or anticipated effects are due to the EU interventions, the full context must be appraised. The question is rather, what would be the situation if there was no EU intervention. This produces a more instant reply.

The EU has initiated important developments in the sector under examination, the projects have yielded good results, and in some parts brought the sector development over a point of 'no return' meaning that the modernisation processes set in motion will not retract, provided that are continuously sustained.

3.3.1.3 *Factors influencing the Demo Projects' achievements*

Q.20. What factors influenced or influence the demo projects' achievements?

The following factors influenced or influence the the demo projects' achievements:

- Unstable – turbulent external political environment;
- Private interests of some community members, on the targeted areas (ie this was the main reason for the unplanned change in Al Shouka – Demo 1 (OXFAM), as some particularly powerful farmers did not receive the benefits they thought they would through this project, and influenced the overall outcome of the first year of the project).
- Social acceptance of a project: It cannot be 100% guaranteed, despite good relationships with the community members and key influencers. It is considered necessary that consistent efforts for awareness raising need to be implemented since the very beginning of the project.
- The limited resources of the Palestinian Government which are acknowledged by all partners, including EU. This is also a fact repeated in numerous studies and evaluation reports.

3.3.1.4 *Unexpected results / Corrective actions*

Q.21. Were there any unexpected results achieved?



The unexpected results can be assessed only in the view of the underlying expectations of the set objectives in the project fiches, and projects' terms of reference/technical specifications. In a linear planning concept, activities completed lead to planned results, thus the outcomes desired, unless, impediments hinder the process.

Positive unexpected results are outcomes which are beyond the imagination of the planner whilst negative unexpected results are the materialisation of unforeseen obstacles. In light of this, there are some positive unexpected results, such as the engagement of the end-recipients and the beneficiaries – direct and indirect - of the demo projects.

Hereto, there are some results being unanticipated, thus unexpected negative results in regards to the disengagement of some targeted populations regarding the interventions being developed and the lack of involvement of some stakeholders, which may hinder the timely implementation.

Per project, the following should be noted:

Demo 1 (OXFAM):

- There were no unexpected results.
- The project faced the change of the target area and the design of sand filter and post treatment plant. These are now in the positive direction.

Demo 2 (ARIJ):

- During project related activities, ARIJ working team worked hand in hand with the different Palestinian Ministries and even with direct follow up of the Palestinian prime minister. Based on coordination works government feedback, ARIJ is expecting soon governmental input to contribute in parallel to project set goals. e.g. expected government funds allocation for enhancing farmers access to the road and solving sewage collection network, which currently faced clogging problems.

Demo 3 (PARC):

- There were no unexpected results.

Q.22. Were corrective actions required and implemented?

Demo 1 (OXFAM):

- The most important change and challenge encountered in the first year of the project was the rejection of the AlShouka community as the target area of the project, due to the opposition of a small group of powerful farmers. This development led to an unexpected change in location to another community, namely the Al-Mawasi. The latter was identified as the most appropriate target land for the change in location, based on the PWA's feasibility study from 2016 and the rapid assessment conducted by Oxfam in March 2018. The location change has influenced other actions as well.
- In Al-Mawasi, the rehabilitation of the existing main treatment plant is underway, including the construction of a new sand filter, pressure pump and carrier line. While the infrastructure faces the constant challenge of electricity cuts and unreliable electricity supply, the effective development of the main treatment plant will ensure the functioning of the first of three post-treatment units. The existing plant needs sufficient electricity supply to treat the sewage and



ensure the standards are respected, which means that the electricity supply needs to pass from 177kW to 443 kW, which could require at least 8 hours of constant supply. As electricity shortage and cuts are recurrent in Gaza, and the supply unpredictable, a solar system could fill the gaps. UNDP is currently implementing a solar system in the existing treatment plant covering 5 dunums provided by PWA and providing about 250kW.

Demo 2 (ARIJ):

- During project related activities , ARIJ working team worked hand in hand with the different Palestinian Ministries and even with direct follow up of the Palestinian prime minister. And based on coordination works government feedback, ARIJ is expected soon governmental input to contribute in parallel to project set goals . e.g. expected government funds allocation for enhancing farmers access to the road and solving sewage collection network, which currently faced clogging problems.

Demo 3 (PARC):

- Regarding the construction of 9 Km of sewer lines after tendering the project, the bid prices were higher than the allocated budget for the project. In order to lower the prices the specifications of some material used changed (without affecting the quality and integrity of work) and about one Km of sewers with all associated manholes, service laterals and connection pits were eliminated. Afterwards, the project was tendered for the second time and the bid prices were lower but still higher than the allocated budget. PARC has looked into other ways in order to save money including negotiating with the contractor in order to provide discount on the final bid price. The lowest price contractor and technically qualified offered 1% discount. As the difference between the allocated budget of the project (900.000 euro) and the new bid price (1.210.818 euro) was equal to 310.818 euros, PARC is looking into the option of transferring money from budget line item (3.5.1 Design and Construction of Anin WWTP – 1,100,000 euros) to budget line item (3.6.2 Construction of 9 Km of sewer lines – 900,000 euros) noting that both are within same main budget heading.
- Anin wastewater collection system has been awarded to Brothers Contracting Company based on the financial and technical evaluation, with a contract amounting to 1.210.818 euros. The agreement with the contractor has been signed on April 22nd 2018. The project is currently under mobilization and the contractor is preparing the drawings.
- A wastewater treatment plant (SBR system) will be constructed in Anin Village to meet several goals and objectives including; utilizing innovative treatment technologies that are suitable for the West Bank/Palestine, utilizing treatment technologies that are easy to operate and maintain, and minimize the amount of energy and water use, achieving compliance with water quality and sludge quality requirements of the PWA and producing an effluent that is of high quality and suitable for agricultural reuse.
- The design of the WWTP is in progress. The plan was to prepare a design – build tender package. Due to the limited budget allocated and the fact that some amount will be transferred from the budget line item of the treatment plant to the wastewater collection system, PARC is considering the approach of detailed designs instead of design – build as a better approach to achieve lower bid prices and reduce the cost of supervision.



- As Eco San organization has already prepared the conceptual designs of the wastewater treatment plant, it would be easier and faster to prepare the detailed designs and a full tender ready package. The construction of the WWTP will be overlapping with the construction of the wastewater collection system and both components are expected to end at the same time.

3.3.2 Recommendations

- Improve project planning and coordination mechanisms, and introduce/strengthen partner consultations from the project preparation phase.
- Introduce improved composition and functions of the Steering Committees, and encourage the participation of a wider range of stakeholders.
- Provide technical assistance support to implementing partners and actors that will undertake the operation of the interventions results, namely WWT plant, in the future for enhancing their management capacity.
- Perform risk analysis at the beginning of all projects; monitor and update regularly the analysis results.

3.4 IMPACT TO DATE & SUSTAINABILITY

The present report aims to look if adequate enabling conditions are in place in order to enhance potential impact of projects' activities and sustainability of results, including the contribution to capacity development.

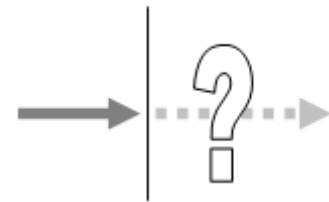
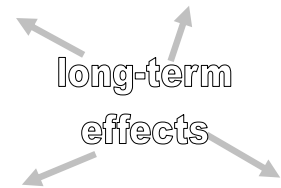
A key consideration here is the extent to which impact can be attributed to the actions of the Demo Projects amongst the actions of the Government and other stakeholders including other international donors. The evaluation also considers how the actions worked together to meet the EU as well as the country's objectives in the Water Sector.

Measurement for the evaluation of impact was based on the projects' documentation, the interviews with stakeholders (contract managers and beneficiaries) and the questionnaire survey, to develop subjective as well as objective data on the Demos' performance. The assessment of impact includes the formulation of broad statements on the state of change in the Water Sector and where credible an examination of the contribution of the Grants assistance.

Sustainability looks at the extent to which the benefits deriving from the Demos are, or are likely to be, sustained. The evaluation reviews both project level performance and more systemic factors that contribute to the potential longer-term success of the interventions.

Information on sustainability is identified in monitoring reports and other project-level and action-level documentation, supported by the field research to identify those factors affecting sustainability.

The report also provides recommendations on the potential to build on lessons learned from the Demos so far and address many of the impediments to sustainability derived in this mid-term assessment.



3.4.1 Analysis

3.4.1.1 *Impact*

Q.23. Are wider impacts as expected from the implementation of the projects?

&

Q.24. Have the wider impacts of the projects achieved so far matched with the objectives, i.e. both in terms of quantity and quality?

Beyond the impact on pollution reduction, in general, wider impacts are too early to be assessed. Nevertheless, the three-demo projects are anticipated to:

- enhance the effectiveness of local water resources governance;
- promote water demand management, water efficiency and non-conventional water resources (in particular recycled and reclaimed water).
- have a positive impact to the living standards of local communities after their full implementation.

Q.25. What contributed to the fulfilment of the objectives and expected results?



The following factors are recognised by the contracting partners as facilitators to the fulfilment of objectives and expected results:

Factors	Demo 1 (OXFAM)	Demo 2 (ARIJ)	Demo 3 (PARC)
a) Good project management on behalf of the EU/Grant managing organisation	x	x	
b) Good coordination/support on behalf of the beneficiary institutions	x	x	
c) Quality of the task managers of the EU/Grant managing organisation	x	x	
d) Quality of project experts	x	x	
e) Technical/consultancy assistance	x		x
f) Size of budget	x	x	
g) Contribution of consortium members/partners (if any) involved	x	x	x
h) Local support (funds or in-kind)		x	
i) EU/Grant managers support and monitoring	x	x	
j) Publicity for project	x		
k) Good project design	x	x	

It is interesting to note the different approach as regards to the recognised factors among the three projects.

Q.26. Have the projects contributed or are anticipated to contribute directly or indirectly to the wider socio-economic development priorities of Palestine? If so in what way?

In general, the Demo projects are anticipated to contribute directly or indirectly to the wider socio-economic development in terms of:

- providing new job opportunities - alleviating disparities in job opportunities between rural and non- rural communities;
- contributing to the development of the agriculture sector by the utilization of treated effluent for agriculture, effluent that will cost the farmers much less than the cost of potable drinking water (thus increasing their competitiveness);
- increasing the living standards of people facing difficulties.

Contracting partners have identified the following priorities:

Priorities	Demo 1 (OXFAM)	Demo 2 (ARIJ)	Demo 3 (PARC)
a) Alleviated regional disparities		x	
b) Economic diversification	x	x	x
c) Increased competitiveness		x	
d) Social inclusion (gender, vulnerable groups, etc...)	x		x
e) Protection of environment	x	x	x



Priorities	Demo 1 (OXFAM)	Demo 2 (ARIJ)	Demo 3 (PARC)
f) Increased living standards	x	x	x
g) No contribution			

Q.27. Have the projects brought benefits to beneficiaries/stakeholders? Can these be reasonably associated with the interventions?

As already said, benefits are too early to be clearly assessed. However, there are points worth mentioning, such as the following:

- The cooperation between the NGOs, the national, regional and local authorities and other stakeholders is advanced through the Demo projects;
- The Demo projects have highlighted the importance of the social dialogue as regards to enhancing the acceptance of the TWW utilization;

3.4.1.2 Continuity

Q.28. Are (or can be considered) the results/impacts of the projects durable over time? In what way?

&

Q.29. Will the projects produce positive effects over time and at a similar or higher level? In what way?

&

Q.30. Will the impacts continue if there is NO more public funding?

&

Q.31. How are long-term needs for support being addressed (maintenance of equipment, continued retraining of staff, continuity of staff and financing)?

It is too early to assess whether the results of the projects will be durable over time, although there are already positive indications towards this direction.

After one year and something of implementation, it is evident that the sustainability of the three demo projects depends on;

- whether funds will be available to (1) cover wastewater treatment operational costs; (2) the availability of qualified human resources to run the wastewater treatment plants;
- the acceptance of people to utilize TWW.

Points that should be stressed out include the following:

Demo 1 (OXFAM):

- The project is expected not only to promote water reuse, but also to provide a more sustainable approach for the agricultural sector, especially under the current circumstances: limited water availability; high level of groundwater salinity due to the proximity to the seashore. Al Mawasi agricultural lands suffer from seawater intrusion and deteriorating groundwater quality.



Currently, the groundwater salinity levels at Mawasi Rafah can peak as high as 10.000 mg TDS per liter.

- Challenges that may affect the projects sustainability are: (1) the provision of electricity needed to run the WWTP and (2) finding the best way of defining a Water Tariff system including the sytem of collecting cost of water.
- The operating cost shall be reduced through the use of a solar system which sall be installed to serve the WWTP. This was not part of the project's activities. UNDP will provide the funds through JICA for its installation.
- By the end of the project, the developed systems and infrastructure will be handed over to PWA and MoA to ensure sustainability.
- A new committee will be formed to run the post treatment unit and the sand filter and hence guarantee the best performance of the tariff system. This committee will be empowered by capacity building and training activities .

Demo 2 (ARIJ):

- The project can be considered as a unique one due to its social, economic, technical and environmental impacts. The project will treat and reuse wastewater in a land (Sa'eer) that does not belong to the generator (Wadi Al Aroub camp) of the wastewater. Compost will be generated from the sludge using the dewatering process. This will protect the surrounding environment from the sludge. Several farmers in the target valley are working in other activities, therefore this project will help these farmers to cultivate their land.
- This project is expected to contribute at the long term in increasing farmers' trust in new irrigation technologies and in the possibility of utilizing treated effluent in restricted irrigation; it is expected over time to contribute in the dissemination of this knowledge to neighboring areas.
- The partnership with the project stakeholder (partners) is expected to continue after the funding period, specially due to the involvement of specialized several ARIJs departments, which among them are: The Water and Environment Research Department (WERD), ARIJ Agriculture Department, ARIJ biodiversity and food security department (BFS), and the socio economic department. All these through research and / or other activities can later on target the area of intervention and may contribute with the project goals even after project completion.
- By the end of the project, a farmers association is provisioned to be established so as to operate the project and guarantee its sustainability; The alternative would be to have a private company to undertake the task , which seems a more preferable and feasible option.
- If over time this model proves to be a successful model to be followed; then this model can be replicated in other communities and it will create not only new job opportunities to farmers, but also can contribute in the NGO sustainability at least during the project implementation period.
- ARIJ installed a prototype in the target valley for the reuse of wastewater. This was used to show farmers the benefits they will gain once they use the reused wastewater to irrigate their lands. Nowadays farmers are looking forward for the commencement time of the project and thinking of expanding the area to be irrigated by the treated wastewater. The project will be owned by PWA and will be run by the farmers' community. Sair municipality promised to give full support to make the project sustainable and hence they are looking from now for donors to



fund the construction of sewage network in Sair to make use of the wastewater treatment plant and its auxiliary units for the purpose of irrigating Sair's agricultural lands from the treated wastewater. Sair's engineering department will train engineers on how to maintain the plant.

- The technology to be used in the dewatering unit and the compost production unit is new in Palestine; hence there is a need to train technicians for its successful operation.

Demo 3 (PARC):

- Although the project is still in its construction stage, it is anticipated to promote sustainable and efficient use of water resources; technical and institutional trainings to operational staff in water and sanitation facilities; experience exchange activities ensuring efficiency, flexibility and simplicity and establishment of the Water Users Associations (WUA) as governing bodies for the new water resources.
- The project is also anticipated to produce positive effects on Anin community by creating jobs with the project's contractor. On the long run, more impact is expected in terms of preventing the environmental hazards due to current practice of dumping wastewater into open environment and ground water basin.
- Building the sewage network and connect houses to the network will prevent current dispute between neighbors due to overfilling of cesspits. The collection and treatment of sewage water is a non-conventional source for providing important quantities of water that will be used for promoting irrigated agriculture in Anin village.
- Multi-beneficial uses of reclaimed water is also anticipated to improve food security and enhance economic development, quality of life and livelihoods in the village. Reclaimed water for healthy ecosystem shall improve carrying capacity, prevent groundwater pollution, enrich socio-cultural and recreation, develop and sustain ecosystem health.
- The training that will be provided for the beneficiary farmers will facilitate and ensure safe handling of reclaimed wastewater in agriculture.
- Stakeholders and beneficiaries of the project are aware of the project's assigned capacity building activities and they experienced part of these activities. Still there is a need for further funds to cover the operational cost. Hence, Anin village council is working from now on finding more funds to expand the collection wastewater system to cover the whole village in the near future.
- The Jenin West Joint Service Council (JSC) will be the owner of the project. It will have the institutional capacity to continue project's generated service. However, finding funds to cover the wastewater treatment operational cost and the availability of qualified human resources to run the wastewater treatment plant, are still risks that need to be confronted.
- The technology to be used in wastewater treatment plant is new in the Palestine, hence there is a need to train technicians for its successful operation. Additionally there is a need to train the expected implementers for handling the project from the financial aspect and hence a tariff system needs to be established to guarantee project's sustainability.
- As a result of the treated wastewater, farmers in the targeted area will have access to extra water sources for irrigation by using appropriate irrigation technologies; these farmers will have additional income sources since they will have the opportunity to plant high value crops.



- Farmers will purchase the treated wastewater at reasonable prices and the cost will be used to run the system, which will ensure continued impact and sustainability including covering its operation and maintenance costs.
- 60% of Anin residents will be connected to sewer lines and WWTP and will save from the unsafe disposal of wastewater and extra financial burden on villagers caused by regular emptying of cesspits (saving of average 250 Euros per year per household).
- The technology used for sewer connection pits will save cost on the municipality as well. This project will have expansion capacity to serve the projected 20-year population.
- The operational power cost for the WWTP will be 50% covered by clean energy, which has economic and environmental positive impacts.

Q.32. Have the projects contributed or are anticipated to contribute to institutional capacity building? If so, in what way?

Points that should be highlighted include the following:

Demo 1 (OXFAM):

- The project is anticipated to contribute to the institutional capacity building of service providers such as Municipality, PEF, PARC WWRU MEMBERS and the workers for TWW quality control (it will cover maintenance, operation, how to cooperate with beneficiary farmers); Capacity building and training of TWWP operators, engineers, and specialists on the practical aspects and applications of post-treatment filtration process.

Demo 2 (ARIJ):

- As it is the first time in Hebron governorate for a project to involve solar system to run a wastewater treatment plant, the ARIJ staff will benefit in building its staff capacity in this area. Also ARIJ staff is attending workshops organized by the EU, hence the staff's technical capacity building will improve.
- Regarding the development of the capacities of stakeholders to manage the reuse of treated wastewater, two introductory meetings and a field visit for the farmers to tour the agricultural landscapes managed by the Good Land Agricultural Cooperative were conducted during the first year. It is worth mentioning that the project activities are being implemented in a participatory approach with all related stakeholders to guarantee the success and the efficient implementation of the project interventions towards achieving the project global and specific objectives.

Demo 3 (PARC):

- The project will promote sustainable and efficient use of water resources; technical and institutional trainings to operational staff in water and sanitation facilities and experience exchange activities will ensure efficiency, flexibility and simplicity and establishment of the Water Users Associations (WUA) as governing bodies for the new water resources.
- The project will provide institutional development support to establish and train the Water Users Association (WUA) in the targeted area. The training will highlight the following issues:



- Water and Irrigation Management: PWA vision and laws regarding WUA and water resources management, formation of association and their benefits, managing supply and demand, water tariffs.
- Management systems: managerial structure, conflict resolutions, communication skills, sustainability of WUA.
- Administrative Systems and procedures: registrations, elections, planning, reporting.
- Financial aspects: bookkeeping/accounting, auditing, managing income and expenses, preparing financial reports and sheets, banks systems, interest rates.
- By-laws concerning vision, mission, organization structure, short and long term objectives, elections, strategic elements.

Q.33. Is there a phase-out strategy defined and (to be) implemented?

&

Q.34. Have projects ensured full ownership, through the support provided and involvement of the main stakeholders?

There is no documented defined phase-out strategy for the demo projects. Nevertheless, the following points should be noted:

Demo 1 (OXFAM):

- By the end of the project, the developed systems and infrastructure will be handed over to PWA and MoA to ensure sustainability. However even unofficially OXFAM declares that it will continue to monitor the results.
- A new committee will be formed to run the post treatment unit and the sand filter and hence guarantee the best performance of the tariff system. This committee will be empowered by capacity building and training activities.

Demo 2 (ARIJ):

- By the end of the project, a farmers association is provisioned to be established so as to operate the project and guarantee its sustainability.
- The alternative to the above would be a private company to undertake the respective task, which seems a more preferable and feasible option.
- ARIJ will work on ensuring that the most appropriate solution is implemented before exiting.

Demo 3 (PARC):

- As earlier said, the Jenin West Joint Service Council (JSC) will be the owner of the project. It has the institutional capacity to continue the services generated by the project but (1) it is necessary to find funds to cover the wastewater treatment operational cost; and (2) to have available qualified human resources to run the wastewater treatment plant. Both the aforementioned are still risks that need to be confronted.
- PARC claims that will strive to ensure the proper continuation of the project by supporting the owners of the project after the funding period .



3.4.1.3 EU visibility

Q.35. To what extent have the projects increased the visibility of EU support?

- During the first year, the partners have taken all necessary measures to publicise the fact that the European Union has financed or co-financed the projects.
- From discussions with partners, beneficiaries and end recipients and the review of developed project materials, it was clear that the EU visibility is high. People are aware of EU's support, and the attitude towards EU is positive.
- More information regarding to this issue is included in Chapter 5.

3.4.2 Recommendations

These can be summarised as follows:

- The most sustainable impact is considered to be on the target groups, with people directly benefiting from support leading to the improvement of their personal situation. The above observation implies that even more sustainable results could be achieved, if cross-sectoral / project fertilisation and complementarity among sectors / projects, which is low, was further strengthened.
- Risk analysis should be conducted at the beginning of all projects. This will allow effective corrective and / or preventive actions to take place, thus ensuring the unobstructed implementation of interventions.
- Consistent efforts for awareness raising, implemented since the very beginning of the projects, are considered essential.
- Conducting awareness sessions and workshops dedicated on the safe use of TWW should be held on a regular basis by the Government and local authorities.
- TWW intervention should include a “cash for work”⁴³ element, the workers should be hired from the area of intervention. In particular
 - “Cash for work” projects are usually managed by an NGO and while skilled labor may be paid for, “cash for work” is not typically used for large contracted construction projects. Unskilled labor payments differ from “cash for work” in that the actual project is the goal (i.e. construction of a TWW facility), skilled labor and materials may be contracted out to a construction company and the management of the paid labor is handled by the contractor. A mix is possible, whereby the NGO manages “cash for work” as unskilled labor on a construction project in conjunction with a contractor or the NGO may stipulate as part of a construction contract that unskilled labor is taken from the immediate community. In this case, the unskilled labor payments are handled by the contractor.

⁴³ Cash-for-Work is a short-term intervention used by humanitarian assistance organizations to provide temporary employment in public projects (such as repairing roads, re-building infrastructure etc) to the most vulnerable segments of a population. The methodology is relatively new, but its use has become increasingly common in food insecure, disaster-affected or post-conflict environments.



- A cash-based approach encourages trade and creates secondary economic benefits. It also allows people greater choice and control over how they will rebuild their lives, thus helping to restore their dignity as well as their livelihoods.
- People need to be reassured that the post implementation phase will be effective (ie the TWW complied with standards etc) so as to accept paying a financial contribution for the provision of TWW.
- Further increase the sense of community ownership on the three projects.
- Demo projects seem to have also an added value to the target country socio-economic development. The main improvements needed refer to policy coordination issues, strategic focusing and higher involvement and ownership on behalf of the local stakeholders.



4. CONCLUSIONS, LESSONS LEARNED & RECOMMENDATIONS

4.1 FINDINGS & RECOMMENDATIONS SUMMARY PER EVALUATION CRITERION

DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Relevance	In general <ul style="list-style-type: none">The three demo projects meet the initially identified needs of the target areas and are in line with the objectives of the PWA. In addition the main needs identified in the relevant strategic documents were so far appropriately covered by the projected interventions.Significant effort has been deployed in response to the objectives of improving water efficiency and promotion of the utilization of non-conventional water resources (in particular recycled and reclaimed water), as well as enhancing the employment and/or living standards of vulnerable groups.	<ul style="list-style-type: none">Enhance scope of the call for proposals, increase focus on specific target groups and type of activities, and where appropriate introduce a territorial dimension.
Relevance	<ul style="list-style-type: none">The strategic coherence of the actions' objectives in relation to the Contracting Authority's priorities is high for all demo projects.Internal coherence of the interventions is appropriate, with projects planned in logical sequence and progressively building on the achievement of previous projects.	<ul style="list-style-type: none">Provide for a greater participation of the private sector.
Relevance	<ul style="list-style-type: none">The external coherence, which was examined in relation with other interventions taken or taking place in Palestine, is appropriately addressed through clearly identified links with interventions in the fields of enhancing effectiveness of local water resources governance and promoting water demand management, water efficiency and non-conventional water. Demo 1 – OXFAM – Al Mawasi <ul style="list-style-type: none">The project adopts PWA strategy in wastewater reuse. At the same time, it will contribute in reducing land-based source of marine pollution.	<ul style="list-style-type: none">Support the implementation of similar projects of larger scale, through wide-range grant schemes, including also support to increasing employment opportunities.Scalability is critical in terms of: a) larger projects (size and



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Relevance	<ul style="list-style-type: none"> The project's log-frame is updated but not significantly changed. 	<p>amount granted); b) projects of similar kind.</p>
Relevance	<ul style="list-style-type: none"> The most important change and challenge encountered in the first year of the project was the rejection of the Al Shouka community as the target area of the project, due to the opposition of a small group of powerful farmers. This development led to an unexpected change in location to another community, namely the Al Mawasi. The latter was identified as the most appropriate target land for the change in location, based on the PWA's feasibility study from 2016 and the rapid assessment conducted by Oxfam in March 2018. 	<ul style="list-style-type: none"> As regards to projects of similar kind, consider the option to design grant schemes allowing to smaller entities to apply for grants, i.e. grant schemes with relatively small size of grants and a larger number of selected beneficiaries.
Relevance	<ul style="list-style-type: none"> The location change has influenced other actions as well. It is expected that due to this change from Al Shouka to Al Mawasi, delays will occur but the main overall objective of this project is still valid. OXFAM and the project's steering committee work hard to compensate this delay. In order to make sure that the project will satisfy the needs of the new targeted location, AlMawasi, a rapid needs assessment was successfully conducted. It is expected that the project is achievable within the provisioned time framework. <p>Demo 2 – ARIJ – Al Aroub</p>	<ul style="list-style-type: none"> Consider the capacity to manage a large number of projects within a context of centralised management, or include the management of large-scale grant schemes under service contracts designed to that extent or as additional tasks within contracts providing for institutional and capacity building support.
Relevance	<ul style="list-style-type: none"> The project objectives are justified in relation to the needs of the target group since the action was envisioned with the participation of the local agricultural cooperative, the local municipal council, representatives from PWA and the Palestinian MoA. The project is in line with PWA strategies in water and sanitation as well with the vision of EU in supporting projects in this area. All needs identified are still valid since sustainability of the wastewater treatment and reuse system is still a priority in addition to job creation and increasing food security and solving the pollution problem that the people face in the targeted area. The project's activities are under implementation and construction according to the original plan. Therefore expected results and activities and assumptions and overall objectives are still valid. Since the start of the project, no regulation, laws or other needs arose. 	<ul style="list-style-type: none"> Social partners' active participation at all levels of implementation is highly recommended.
Relevance	<ul style="list-style-type: none"> All project's objectives and implementation activities are known and accepted by all parties including stakeholders and beneficiaries 	<ul style="list-style-type: none"> Develop a strategy and action plan, containing clear targets and links to



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Relevance	<ul style="list-style-type: none"> Activities have been updated in order to adapt to changes that have occurred over the project's lifetime due to land purchase delays as consequence of autocratic processes which lead to domino effect in the implementation of the different interventions on those project purchased land parcels. All updated activities were sent to EU representative to get approval. The project team had to do changes in the items that will be covered by the co financing. While initially the Palestinian Ministry of Local Government committed itself to finance the Solar System of the Wadi al Aurb Wastewater Treatment Plant, it (the MoLG) requested to switch the co-financing from the solar system component to the infrastructure expenses. The reason behind this change is that MoLG could not allocate the budget in the 2017/2018 fiscal year and their willingness to have the solar system as soon as possible to reduce the electricity bill. 	<p>other strategies ie employment strategy etc.</p> <ul style="list-style-type: none"> Improve coordination with other donors / NGOs through increased consultations and capacity building in funds' coordination.
Relevance	<ul style="list-style-type: none"> A risk analysis was not carried out before the project was implemented. This is recognized as a significant issue. ARIJ already installed a small pilot project in a land nearby the project area where the beneficiary farmers make use of the treated wastewater in an irrigated small area cultivated by the farmers. As such, the farmers have strong trust that the project will achieve its objectives and fulfil their needs. Until now there is no idea about the operating and running cost of the project once it commences. 	
Relevance	<p>Demo 3 - PARC – Anin</p> <ul style="list-style-type: none"> Activities are under implementation and construction according to the original plan. Therefore expected results and activities and assumptions and overall objectives are still valid. Since the start of the project, no regulation, laws or other needs have come to light. 	
Relevance	<ul style="list-style-type: none"> The project still responds to the beneficiaries' needs; there is a pressure and request from the community to expand the project by connecting all houses and not only the provisioned 65% of houses. The management team adjusted some parts of the design in order to reduce sewage network cost without affecting the integrity and efficiency of the sewage network. All project's objectives and implementation activities are known and accepted by all parties including stakeholders and beneficiaries. What is achieved on ground until now is according to the planned framework. The outcomes of the project are known and clear to all stakeholders and beneficiaries. The project still responds to the needsof the target area and it is in line with the PWA strategy to treat wastewater for reuse in irrigation. 	
Relevance		



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Relevance	<ul style="list-style-type: none"> The project started with no sustainability desk study. Even in the implementation period, it started with not enough funds. When the project was accepted by the EU, 20% of the project's budget was assigned as financial community contribution. According to the director of Jenin West JSC this is too much and can't be afforded by the community. As no risk analysis study was carried out before the start of the project, it is expected that when the WWT unit and the sewage pipelines network are constructed, then the project will be under risk. This risk is composed of two components: 1- not available funds to connect houses to the sewage network; 2- no estimation or calculation of the operating cost and cost of treated wastewater and hence no budget was allocated for the operation cost of the project. 	
Efficiency	<p>In general</p> <ul style="list-style-type: none"> Within the course of implementation of all three-demo projects there was a necessity to differentiate activities, either in terms of budget, scope or even both, without however altering the final output. The provisional duration of the projects is anticipated to last more than what was initially designed; this will be remedied, by extensions and contract addendums. This could have been managed if a thorough risk assessment was carried out beforehand. Demo project 2 and demo project 3 will certainly require time extension to accomplish the objectives. In terms of efficiency of the demo projects' interventions and with regard to the design, it is clear that without sufficient support on behalf of the main government organisations, it is difficult to reach the intended impacts. At the beneficiaries' level there is sufficient capacity to carry out the foreseen activities, particularly at the level of the main implementing partners. 	<ul style="list-style-type: none"> Risk analysis should be conducted at the beginning of all projects. Consistent efforts for awareness raising, implemented since the very beginning of the projects, are considered essential. Conducting awareness sessions and workshops for the safe use of TWW should be held on a regular basis by the Government and local authorities. Attention should be paid to the design of the projects in consideration
Efficiency	<ul style="list-style-type: none"> Some problems have been encountered due to lack of clarity in the definition of the roles and responsibilities of the consortium members. Methods and tools used to monitor, collect data and report results have been adequate during the first year. 	



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
	Demo 1 – OXFAM – Al Mawasi <ul style="list-style-type: none"> Needs assessment was carried out for the new targeted location. Project resources are managed in a transparent and accountable manner and the disbursement of funds is regular and follows internal financially monitoring procedure. For the purpose of internal monitoring there are 1) field workers from all partners who continuously provide feedback on their field visits; 2) the feedback mechanism of OXFAM, hotline and online application on tablets; 3) the progress meetings between partners and communities; 4) the monthly narrative updates; 5) questionnaires and cross check methods. 	of the capacity of the stakeholders. <ul style="list-style-type: none"> Project management systems and procedures should be strengthened in order to avoid shortcomings in the decision making process.
Efficiency	<ul style="list-style-type: none"> The overall achievements during Year 1 include Oxfam and its local partners' successful mitigation to re-locate the Action to Al Mawasi in Rafah Governorate; strengthening successful partnership and synergies between Oxfam and government stakeholders such as the PWA, CMWU, MoA, and MoH through its local partners and the PSC; and beginning technical design and legal frameworks. 	<ul style="list-style-type: none"> Stakeholders analysis is considered a critical success factor and should be conducted at the beginning of projects (ideally it would be useful beforehand).
Efficiency	<ul style="list-style-type: none"> A gender analysis was completed to determine and actively plan women's involvement in TWW management and community mobilization. Overall, Year 1 was successful in realizing plans to contribute to irrigation improvements in Southern Gaza and establishing synergies with key actors, such a PECNDAR. PEF also frequently updates the MoA on all project's implementation and challenges; and asks for support and intervention when needed. The WASH activities are closely coordinated with PWA and CMWU as the state's service provider for water and sanitation services. Moreover, PEF regularly coordinates with MoA as the regulatory authorized level for WWR activities in the Gaza Strip. 	<ul style="list-style-type: none"> Steering Committees should be formed and be flexible.
Efficiency	<ul style="list-style-type: none"> All steering committees are engaged in the review of design the post treatment, implementation, and monitoring of project activities according to their competence within the roles and responsibilities set out in the Palestinian legal framework. 	<ul style="list-style-type: none"> Keep all partners informed about all activities and difficulties faced during the implementation of a project. When it comes to any milestone activity or decision, it is necessary to record it in minutes of meeting where all partners have a copy of it.



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Efficiency	<ul style="list-style-type: none"> There will be some delay due to importation of material from siege the Gaza Strip. This need advance coordination with the Authorities to get clearance to bring the materials used in construction. This may lead to delay in finishing the respective construction work at the planned date. 	<ul style="list-style-type: none"> Further inclusion of employers and their associations
Efficiency	<p>Demo 2- ARIJ – Al Aroub</p> <ul style="list-style-type: none"> The budget has been adjusted mainly due to: 1) Technical different land parcel civil works needs from the original site that was assumed to be adopted at the project baseline survey phase, and at the end it was not possible to be purchased and adopted to serve project goals; 2) During project implementation works were preceded with an intensive study of alternatives, task done previous the finalization of tender documents and designs and that resulted in necessary technical modifications, for multiple reasons: safety, produced compost quality. project sustainability. The realization of the above mentioned in most of cases includes more activities and works than the originally stated in the original proposal. These changes in the different budget lines were mostly summarized in shifting between budget lines and by using contingency. 	
Efficiency	<ul style="list-style-type: none"> As the most difficult problems to overcome during implementation until now have been reported the following: 1) Lack of cooperation from consortium members/partners. The lack of farmers willingness to have a farmers cooperative to represent them, preferring instead working in an individual manner; which at the end forced the working team to work with individual farmers instead of dealing with an institution that represent them (ARIJ expected high farmers willingness to work as a group , and not as individual farmers); 2) Complexity of rules and procedures – legislative and regulatory framework: Bureaucratic procedures and governmental procedures made the project interventions land purchase a complex mission (ARIJ expected more active governmental involvement to solve this issue specially that implemented tasks are for the benefit of a wide community; 3) Cash flow difficulties: This is related to the co-financing expected from the Ministry of Local Government. MoLG was responsible for the establishment of the solar system which is not related to the cash flow of the project itself. This was intended to be included in the MoLG fiscal budget 2017-2018. 	
Efficiency	<p>Demo 3 - PARC – Anin</p> <ul style="list-style-type: none"> Needs assessment was carried out. There are two partners for the project: Eco San and Bir Zeit University. These partners are involved in the activities assigned to them as in the proposal but some delays occurred. At the start of the project, 	



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Efficiency	<p>a technical committee composed of Beir Zeit University, PWA, MoA, and Jenin West JSC and a steering committee were established. Meetings of the steering committee are supposed to be every six months but due to the absence of some members of the committee, delays occur in holding the meetings. Minutes of meetings are distributed to all partners and related committees' members for approval before the forthcoming meeting. Communication between responsible persons in committees is satisfactory.</p> <ul style="list-style-type: none"> Currently activities are planned as in the original proposal and are implemented according to the set deadlines. Community financial contribution is still not paid in cash. EU agreed on the commitment provided by several governmental authorities to cover parts of community contribution. PWA will cover all houses connection expenses to the main sewage network, MoA will provide seedlings, Ministry of Works will pave the road leading to the wastewater unit and Energy authority will cover the expenses of solar panels. Any delay or discontinuation of these commitments is a risk to the project as it will result to not being able the project to be completed and hence not treated wastewater. Disbursement of funds is based on making payment when an activity finishes. Unfortunately, international payment to cover consultancy works carried out by Eco San is not done due to some bureaucrat procedure. The project coordinator and field engineer monitor activities under implementation and do modifications needed in order to reduce the cost but without reduction of project's quality. Members of technical and steering committees are informed on any corrective measures taken. Until now there is no need for expert mobility from Eco San to Palestine. This will be needed when the wastewater treatment unit is built and there is a need to train operators on how to operate/manage the unit. The budget of the project was underestimated. It is expected that there will be a deficit of budget on some activities, therefore the technical committee is studying the cancellation of "less important activities" such as staff travelling and other desk studies and transfer their budget to other urgent and underestimated activities, ensuring that the transfer will result in accomplishing the project. This transfer will be carried out on condition that it will not have negative effects on project's outcomes. 	
Effectiveness	<ul style="list-style-type: none"> Overall, projects seem to be reaching their goals and objectives translating the project level outputs into results and impacts. However, the fulfilment of some objectives is questioned (if further actions not initially provisioned do not take place). 	<ul style="list-style-type: none"> Improve project planning and coordination mechanisms, and introducing/strengthening



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Effectiveness	<ul style="list-style-type: none"> All three-demo projects ultimately managed to convince the targeted populations of the benefits of reusing treated wastewater in irrigation. It is confirmed by this evaluation, that the level of commitment and ownership on behalf of government and local community stakeholders is an important factor (if not the most important) affecting all demo projects achievements. 	<p>partner consultations from the project preparation phase.</p> <ul style="list-style-type: none"> Introduce improved composition and functions of the Steering Committees at project level, and encourage the participation of a wider range of stakeholders.
Effectiveness	<p>Demo 1 – OXFAM – AI Mawasi</p> <ul style="list-style-type: none"> Oxfam, and its local partners PEF and PARC made progress in implementing activities under the five Outputs during the reporting period. The project is expected to achieve its results. During the 1st year the project experienced a major challenge which impacted the implementation and achievement of the expected results: the target area changed from the AI Shouka community to AI Mawasi. Another major challenge encountered in the 1st year concerned security constraints along the Eastern Rafah- Egyptian border where AI Shouka was located. The change to AI Mawasi minimized the latter as well as the risks associated with it. 	<ul style="list-style-type: none"> Provide technical assistance support to implementing partners and actors that will undertake the operation of the interventions results, namely WWT plants in the future for enhancing their management capacity. This is a sine qua non for sustainability.
Effectiveness	<p>Demo 2 – ARIJ – AI Aroub</p> <ul style="list-style-type: none"> The problem of purchasing the parcel land resulted to unexpected delays. Delay in co-financing from the MoLG affect some of the activities in the ongoing plan. This forces ARIJ to ask for extension for the implementation plan. Despite these delays, the project's activities are on track. The following activities were accomplished: 1) Conducting the environmental impacts assessment (EIA) study for the dewatering-sludge and composting facility, 2) Finalizing the Sludge Dewatering technologies study, which included: i) carrying out a comparison study of sludge dewatering technologies and composting facility covering both technical and financial aspects, ii) development of the engineering designs related to sewage sludge dewatering system, iii) preparation of the composting facility design and the technical specifications, iv) design the solar power special condition and the technical specifications, v) identification of suitable locations for the different project interventions, and vi) preparation of the tender documents 	<ul style="list-style-type: none"> Perform risk analysis at the beginning of all projects; monitor and update regularly the analysis results.
Effectiveness		



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Effectiveness	for the Solar system and in advertising for its tendering. These activities have been considered the basis of the work upon which the other project activities will build.	
Effectiveness	<ul style="list-style-type: none"> Achievement degree is estimated to be around 50% despite the fact that works on ground are delayed. During project related activities, ARIJ worked hand in hand with the different Palestinian Ministries and even with direct follow up of the Palestinian Prime Minister. ARIJ is expecting soon governmental input to contribute in parallel to project set goals . E.g. Expected government funds allocation for enhancing farmers access to the road and for solving sewage collection network currently faced clogging problems. 	
Effectiveness	<p>Demo 3 - PARC – Anin</p> <ul style="list-style-type: none"> The wastewater collection system is under construction, the bidding for the construction of treatment plant is open for specialist companies to apply, awareness and capacity building of the target groups including school students and farmers were carried out (500 school students and 15 farmers have been trained on the benefits of using treated wastewater to irrigate their crops). 	
Impact & Sustainability	<p>In general</p> <ul style="list-style-type: none"> All three-demo projects are anticipated to have a positive impact to the local communities after their full implementation and enhance the effectiveness of local water resources governance. The sustainability of the three demo projects depends on whether funds will be available to (1) cover wastewater treatment operational costs; (2) the availability of qualified human resources to run the wastewater treatment plants. The sustainability of the three demo projects depends on the acceptance of people to use TWW. There is no documented defined phase-out strategy for the demo projects. EU visibility is high. <p>Demo 1 – OXFAM – Al Mawasi</p> <ul style="list-style-type: none"> In general it is too early to assess the impact. 	<ul style="list-style-type: none"> Further strengthen cross-sectoral / projects fertilisation and complementarity among sectors / projects. Risk analysis should be conducted at the beginning of all projects. This will allow effective corrective and / or preventive actions to take place, thus ensure the unobstructed implementation of interventions Consistent efforts for awareness raising,
Impact & Sustainability		



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Impact & Sustainability	<ul style="list-style-type: none"> The project is expected not only to promote water reuse, but also to provide a more sustainable approach for the agriculture sector, especially under the current circumstances: limited water availability; high level of groundwater salinity due to the proximity to the seashore. Al Mawasi agricultural lands suffer from seawater intrusion and deteriorating groundwater quality. Currently, the groundwater salinity levels at Mawasi Rafah can peak as high as 10.000 mg TDS per liter. Challenges that may affect the project's sustainability are (1) the provision of electricity needed to run the WWTP and (2) finding the best way of defining the Water Tariff system including the system of collecting cost of water. 	<p>implemented since the very beginning of the projects, are considered essential.</p> <ul style="list-style-type: none"> Conducting awareness sessions and workshops for the safe use of TWW should be held on a regular basis by the Government and local authorities
Impact & Sustainability	<ul style="list-style-type: none"> The operating cost shall be reduced through the use of a solar system which shall be installed to serve the WWTP. This was not part of the project's activities. UNDP will provide the fund through JICA for its installation. By the end of the Action, the developed systems and infrastructure will be handed over to PWA and MoA to ensure sustainability. A new committee will be formed to run the post treatment unit and the sand filter and hence guarantee the best performance of the tariff system. This committee will be empowered by capacity building and training activities 	<ul style="list-style-type: none"> TWW intervention should include a cash for work element, the workers should be hired from the area of intervention.
Impact & Sustainability	<p>The project is anticipated to contribute to institutional capacity building: service providers such as Municipality, PEF, PARC WWRU MEMBERS and the workers TWW quality control (it will cover maintenance, operation, how to cooperate with beneficiary farmers); Capacity building and training of TWW operators, engineers, and specialists on the practical aspects and applications of post-treatment filtration process.</p>	<ul style="list-style-type: none"> People need to be reassured that the post implementation phase will be effective (ie the TWW complied with standards etc) so as to accept paying a financial contribution for the provision of TWW.
Impact & Sustainability	<p>Demo 2- ARIJ – Al Aroub</p> <ul style="list-style-type: none"> In general, it is too early to assess the impact. The project can be considered as a unique one due to its social, economic, technical and environmental impacts. The project will treat and reuse wastewater in a land (Sa'eer) that does not belong to the generator (Wadi Al Aroub camp) of the wastewater. Compost will be generated from the sludge from the dewatering process. This will protect the surrounding environment from the sludge disposal. Several farmers in the target valley are working in other activities, therefore this project will help them to return and use their land. 	<ul style="list-style-type: none"> Further increase the sense of community ownership on the three projects



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Impact & Sustainability	<ul style="list-style-type: none"> This project is expected to contribute at the long term in increasing farmers trust in new irrigation technologies and in the possibility of utilizing treated effluent in restricted irrigation; it is expected over time to contribute in the dissemination of this knowledge to neighboring areas. The partnership with the project stakeholder (partners) is expected to continue after the funding period, specially that the nature of involvement includes the specialization of several ARIJs departments. All that through research and other activities that can later on target the area of intervention may contribute with the project goals even after project completion. 	
Impact & Sustainability	<ul style="list-style-type: none"> It is expected that the project implementation will generate new job opportunities (Mainly in the agriculture sector), and that will contribute in alleviating disparities in job opportunities between rural and non- rural communities. By the end of the project, a farmers association is provisioned to be established so as to operate the project and guarantee its sustainability; The alternative would be to have a private company to undertake the task which seems a more preferable and feasible option. 	
Impact & Sustainability	<ul style="list-style-type: none"> If over time this model proves to be a successful model to be followed; then it can be replicated in other communities and it will create not only new job opportunities to farmers, but also can contribute in the NGO sustainability at least during the project implementation period. ARIJ installed a prototype in the target valley for wastewater reuse. This was used to show farmers the benefits they will gain once they use the reused wastewater to irrigate their lands. Nowadays farmers are looking forward for the commencement time of the project and thinking of expanding the area to be irrigated by the treated wastewater. 	
Impact & Sustainability	<ul style="list-style-type: none"> The project will be owned by PWA and will be run by a farmers' community. Sair municipality promised to give full support to make the project sustainable and hence they are looking from now for donors to fund the construction of sewage network in Sair to make use of the wastewater treatment plant and its auxiliary units for the purpose of irrigating Sa'eer's agricultural lands from the treated wastewater. Sair will train engineers from its engineering department on how to maintain the plant. The technology to be used in the dewatering unit and the compost production unit is new in Palestine; hence there is a need to train technicians for its successful operation. <p>Demo 3 - PARC – Anin</p> <ul style="list-style-type: none"> In general, it is too early to assess the impact. 	



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
Impact & Sustainability	<ul style="list-style-type: none"> Although the project is still at its construction stage, it is anticipated to have positive impact on Anin community by creating jobs with the project's contractor. On the long run, more impact is expected in terms of preventing the environmental hazards due to current practice of dumping wastewater into open environment and ground water basin. Building the sewage network and connect the houses to the network is anticipated to prevent current dispute between neighbors due to overfilling of cesspits. The collection and treatment of sewage water is a non-conventional source for providing important quantities of water that will be used for promoting irrigated agriculture in Anin village. 	
Impact & Sustainability	<ul style="list-style-type: none"> Multi-beneficial uses of reclaimed water is anticipated to improve food security and enhance economic development, quality of life and livelihoods in the village. Reclaimed water for healthy ecosystem shall improve carrying capacity, prevent groundwater pollution, enrich socio-cultural and recreation, develop and sustain ecosystem health. The training to be provided for the beneficiary farmers will guarantee safe handling of reclaimed wastewater in agriculture. 	
Impact & Sustainability	<ul style="list-style-type: none"> Stakeholders and beneficiaries of the project are aware of the project's assigned capacity building activities and they have experienced part of these activities. Still there is a need for additional funding to cover the operational cost. Hence, Anin village council is working from now on finding more funds to expand the collection wastewater system to cover the whole village in the near future. The Jenin West Joint Service Council will be the owner of the project. It has the institutional capacity to continue the generated services by the project but (1) it is necessary to find funds to cover the wastewater treatment operational cost; and (2) the availability of qualified human resources to run the wastewater treatment plant. Both are still risks that need to be confronted. 	
Impact & Sustainability	<ul style="list-style-type: none"> As a result of the TWW, farmers in the targeted area will have access to extra water sources for irrigation by using appropriate irrigation technologies; these farmers will have additional income sources since they will have the opportunity to apply irrigated agriculture and plant high value crops. Farmers will purchase the treated wastewater at reasonable prices and the cost will be used to run the system which will ensure continued impact and sustainability including covering operation and maintenance costs. 	
Impact & Sustainability	<ul style="list-style-type: none"> About 60% of Anin residents will be connected to sewer lines and WWTP and will save from the unsafe disposal of wastewater and extra financial burden on villagers caused by regular emptying of cesspits (saving of average 250 Euros per year per household). 	



DAC CRITERIA	FINDINGS	RECOMMENDATIONS
	<ul style="list-style-type: none">▪ The technology used for sewer connection pits will save cost for the municipality as well. This project will have expansion capacity to serve the projected 20-year population.▪ The operational power cost for the WWTP will be 50% covered by clean energy, which has economic and environmental positive impacts.	



4.2 CONCLUSIONS, LESSONS LEARNED & RECOMMENDATIONS SUMMARY

This section summarises conclusions, lessons learned and recommendations of the mid-term assessment.

Conclusions

- The analysis of the intervention logic of all three-Demo projects and the desk review, illustrate that the projects contributed to the respective objectives of the strategic and programming documents.
- The main objective of contributing to reduced marine pollution and a more sustainable use of scarce water resources in Palestine is met. In addition, all three Demo projects address the issue concerning capacity building and stakeholder engagement.
- There is a positive correlation between planned and actual activities of the projects, which generally contributes to the objectives of the strategies.
- All projects face delays and difficulties but in the end it seems that they will manage to overcome them. It is important to stress out that these difficulties could be attributed, to some extent, to the call for proposals itself, but nonetheless the following elements were observed: lack of prior consultations with local communities and other stakeholders, improper selection of site, underestimated budgets, lack of local support, lack of provisions of operation and therefore problems in sustainability and continuity. Complementary to the aforementioned, the following elements should be highlighted for each demo project:
 - Demo 1- Oxfam:
 - Design problems due to the non-realization of a thorough prior consultation and prior risk analysis at the initial design phase: The Action's targeted location had to move from Al Shouka to Al Mawasi due to the lobbying efforts against the Action by four major large-scale and influential Al Shouka farmers who completely rejected TWW usage for agricultural irrigation. This development could be also perceived as an indication of lack of knowledge on the region's local dynamics.
 - Demo 2-ARIJ:
 - Non effective planning due to the non-realization of prior risk analysis at the design phase. There are actions, such as: a) sludge dewatering excavations and civil works, b) compost facility land preparation and civil/mechanical works, c) operation of sludge dewatering and compost facility, which are being implemented with some shift from what was set in the project original action plan, mainly resulted from the unexpected faced land parcels procurement.
 - Demo 3-PARC:
 - Design problem in terms of the project budget due to the non-realization of prior consultation, prior risk analysis at the design phase: When the project was accepted by



the EU, 20% of the project's budget was assigned as financial community contribution. This seems to be high and difficult for the community to afford. In addition, as no risk analysis study was carried out before the start of the project, then it is expected that when the WWT unit and the sewage pipelines network are constructed, then the project will be under risk. This risk is composed of two components: 1- not available funds to connect houses to the sewage network; 2- no estimation or calculation of the operating cost and cost of TWW and hence no budget was allocated for the running cost of the project.

- All Demo projects are anticipated to have a positive impact to the local communities after their full implementation and enhance the effectiveness of local water resources governance.
- There is no documented defined phase-out strategy for the demo projects.
- The evaluation identified several good practices worth taking on board for the future programming, but also some opportunities for enhancing/maximising the projects' results through identification of risks beforehand and elaboration of a thorough action plan for addressing the potential risks and improving design and implementation of the interventions.
- Regarding the quality of the call for proposals for grants, it is generally very positive, although there is room for improvement. The global and specific objectives could be further linked to the expected results.
- Focus should be given on the intended change and have a clear vertical logic. The clarity of the objectives is not just a matter of formulation. Clearer objectives would bring more focused activities and would allow for better monitoring and evaluation of the expected results. Moreover, projects' design should include clear and realistic indicators of achievement.

Lessons learned

- There are opportunities for improvement in terms of designing more targeted interventions in consideration of the sector's needs and the target groups.
- There is an inherent problem: A thorough risk analysis should be requested if not at the proposal phase, at least at the very beginning of the projects. In some cases, it might be useful even at a later stage.
- Technical challenges or innovations dominate the core of the projects. Emphasis should be given on arrangements for financing and achieving sustainability of the projects, so that a scalability model is fostered in the region. Currently, scalability as well as replicability of projects is seen from the aspect of whether the partners and the involved parties will have additional resources (funds) to proceed with applying the same methods / implementing the same interventions, in other areas with similar conditions.
- Social acceptance of a project cannot be 100% guaranteed, despite good relationships with the community members and key influencers. There needs to be consistent efforts for awareness raising, implemented since the very beginning of the project, including through education interventions at schools.
- Further to the above point, engagement of stakeholders is essential, should the projects seek to serve as model for future projects, thus promoting scalability. Therefore stakeholders analysis is highly recommended for all projects.



- Outputs and deliverables are intended to serve the needs of the beneficiaries. It is therefore, important that beneficiaries profit from their implementation on learning how to do the right things in a better way. To this end, the pilot projects should focus more on promoting the capacity building of local institutions and spread modern techniques and methodologies on the topics addressed by the initiatives. These are important results that should be ultimately requested at the very end from the three demo projects, currently being monitored.
- It is too early, however, to assess if the projects are able to achieve the above mentioned . Maybe, some or all fail partially in some aspects of the outputs that are supposed to deliver. However, if they manage to serve the purpose said they should be considered as successful.

Last, it is interesting to be noted that all Demo partners declare that there are not actions that could have been implemented differently, in a better way and, perhaps, more efficient. This is considered reasonable, however, they actually imply that: a) working in a very complex environment, they did not do something wrong; b) all adjustments, modifications, changes to the context of the projects were due to external factors. So to cope with this, at the closure of the projects, all partners should be requested to provide recommendations on how they would have drafted differently the call that guided the drafting and design of their work plan, which at certain points had to be revised.

Main Recommendations

RECOMMENDATION 1	Enhance the scope of the call for proposals, increased focus on specific target groups and type of activities, and where appropriate introducing a territorial dimension.
RECOMMENDATION 2	Provide opportunities for greater participation of the private sector: a) to attract capital investment; b) to improve technical and managerial efficiency, promoting the idea of having as an integrated part of the governance of the projects, private sector involvement.
RECOMMENDATION 3	Support the implementation of similar projects of larger scale, through wide-range grant schemes, including also support to increasing employment opportunities.
RECOMMENDATION 4	Perform Risk Analysis at the beginning of all projects; monitor and update regularly the analysis results.
RECOMMENDATION 5	Improve project planning and coordination mechanisms and introduce/strengthen partner consultations from the project preparation phase.
RECOMMENDATION 6	Strengthen cross-sectoral / projects fertilization and complementarity among sectors / projects.



RECOMMENDATION 7	Include a cash for work element on TWW interventions. This approach encourages trade and creates secondary economic benefits. It also allows people greater choice and control over how they will rebuild their lives, thus helping to restore their dignity as well as their livelihoods
RECOMMENDATION 8	Employ labour force from the areas of interventions, thus enforcing local employment, boosting local economy and enhancing acceptance of the projects
RECOMMENDATION 9	Increase the sense of community ownership on the three projects.
RECOMMENDATION 10	Engage stakeholders and insist on awareness raising actions, since the very beginning of the projects.



5. AD HOC ASSISTANCE

As it is already mentioned, the objectives of this assignment is (1) to perform external monitoring (mid-term assessment) for each one of the three SWIM Demo projects (phase II); and (2) to provide ad hoc technical assistance to the Demo projects upon request. However, as Demo project activities started in February and March 2017, and their first annual report is expected during the time interval between April to June 2018, it is considered that the time available is very limited to conduct the Demo needs assessment and provide technical assistance to cover the identified needs. Therefore, the alternative action that was suggested by the SWIM H2020 SM was to enhance the Demo project actors' capacity and visibility.

Regarding the capacity building, the project team identified opportunities for the Demo projects implementing partners and target beneficiaries to participate in the SWIM-H2020 regional events, according to their scope of work and be trained. The aim is that during these events, the representatives of the Demo projects' and their target beneficiaries will also from their side, share their knowledge, practical experiences and encountered problems in the application of their work in small scale, with the rest of SWIM H2020 SM event participants who are involved in projects of a larger scale, thus enhancing cross-fertilization and contributing to the application of the Demo projects' work on a larger scale.

As Demo projects are related to small scale wastewater treatment plants linked with treated wastewater reuse in agriculture, the Demo projects implementing partners were invited to participate in the the Regional training (REG-8) "Technical, Regulatory, Legal, and Cultural Aspects of Treated Wastewater Reuse", held in Athens in July 2018. The main objective of the regional on-site training REG-8 was to enhance the knowledge of the key stakeholders who are involved in technical, institutional, regulatory and managerial aspects for the promotion and development of efficient and secure reuse of wastewater in climate deficit countries. REG-8 was considered to be highly relevant to the Demo project's scope of work as all the participants were active and sufficiently initiated on wastewater reuse and its benefits, and its modules capitalized on the achievements and initiatives undertaken by countries in the development of wastewater reuse and sought to improve knowledge on emerging and key aspects that are still deficient in targeted countries at varying degrees depending on the context. Demo projects participation allowed some lessons to be learned to enrich some topics of modules 1 and 3 (technical and financial constraints).

Demo participants were asked to summarize in 5-6 slides the design and the results to be achieved by their projects highlighting: i) the technical and economical feasibility of the projects components, ii) the current destination of treated wastewater and / or sludge, iii) compliance with existing standards, and iv) replicability of projects. The final Report of REG8 was shared with the demo projects.

In addition, some Expert Facility activities were considered to be useful and relevant to the demo projects' scope of work such as: EFS-DZ-1 "Appui à la réutilisation des eaux usées traitées en agriculture, par la sensibilisation et la prise de conscience", EFS-LB-2 "Private Sector involvement in water infrastructure with emphasis on wastewater treatment plants", EFS-MO-2 "Appui à la promotion de la réutilisation des eaux usées par le renforcement des aspects institutionnels, réglementaires et financières, ainsi que des démarches participatives, des mesures incitatives et la sensibilization" . The



demo projects implementing organisations were informed about them and were directed to the SWIM-H2020 web site where the final outputs of these activities are uploaded.

As far as the promotion of the demo projects visibility is concerned, SWIM-H2020 web site has a dedicated section for the demo projects, where interested parties can learn about them. In order to make the web site more accessible to users for the demo projects, a slight re-arrangement was made. In particular: a) In the SWIM-H2020 homepage, the user by clicking the Section Activities and then the WP5 can find information on the External Monitoring of the SWIM Demo projects (<https://www.swim-h2020.eu/external-monitoring-of-the-swim-demos/>) and b) In SWIM-H2020 homepage, the user by clicking the Section Demo Projects can find information of all SWIM Demo Projects (<https://www.swim-h2020.eu/demos-projects/>). By clicking the second link "External Monitoring of the SWIM DEMOS", the user can find the available information via the Section Activities, WP5.

Demo projects implementing organisations were asked to produce a snapshot of their project and be sent to the SWIM-H2020 project team along with some representative photos. The brief summary sent to the project team was restructured to follow a template for homogeneity purposes and together with the photos were uploaded to the SWIM-H2020 web site.



6. ANNEXES

6.1 ANALYTICAL BASE OF THE EVALUATION QUESTIONS

The following tables depict

- The strategic coherence of the Demo projects' objectives – activities to the priorities – areas of intervention set by the Contracting Authority
- Methodological elements addressed by the projects, as set by the Contracting Authority

Both tables should be read in conjunction to the findings of the analysis as regards to the relevance criterion.



Table – Strategic Coherence

Table 6-1: Strategic coherence (+++ Strong link; ++Average link; + small link; no symbol denotes insignificant or no link)

PRIORITIES - AREA(S) OF INTERVENTIONS	PROJECTS' OBJECTIVES - ACTIVITIES											
	DEMO 1- OXFAM - GAZA					DEMO 2 – ARIJ – ALAROUB				DEMO 3 – PARC - ANIN		
	200 dunums of productive agricultural land irrigated by reuse of TWW system	WW re-use management institutionalized and governance model / tariff system	A monitoring and verification system for the full treatment and reuse cycle, monitoring, established and activated	A replicable model for TWW re-use for agricultural irrigation	Acceptance of using TWW for agriculture irrigation by farmers and consumers	Demonstrate the feasibility of reducing the O&M costs of wastewater treatment	Gain economic advantage for farmers by introducing innovative irrigation practices	Enhancing organizational, technical, financial and business capacities of the local agricultural cooperative qualifying it to manage TWW distribution and reuse scheme	Improve the quality, pricing, and marketability of agricultural commodities and compost	Management of rural WW and environment improved in a sustainable and socioeconomic manner	Promoting demand and access to additional water resources and irrigated area for agricultural purposes using reclaimed WW	Capacity building of farmers groups, public service providers, and local and regional authorities
I. Enhancing effectiveness of local water resources governance	+	+		+	+++	++	+	++	+++	+	+	++
II. Adapting and enhancing resilience to the water-related impacts of climate change	+			+		+					++	+
III. Promoting water demand management, water efficiency and non-conventional water resources (in particular recycled and reclaimed water), and protecting water quality and the good ecological status of water bodies	++	++		++	++	++	+	+	+++	+++	++	++
IV. Optimising water financing and related instruments, with emphasis on innovative mechanisms at local level		+++		++	+	+++		+	+	++	+	+
V. Improving the management of municipal waste, urban wastewater, and/or industrial emissions in order to minimize or prevent the release of pollutants in water bodies	++	+++	+	+++	++	++	+	+++	++	+	+	+



Table – Correlation Matrix

Each cell in the tables can obtain a value in the range of 3 to -3, according to the following scale:

3: highly beneficial contribution; 2: medium beneficial contribution; 1: low beneficial contribution; 0: no contribution

The sum of the values in each row of the table shows the cumulative contribution of the Demo Projects in each element. As a result relevant conclusions can be drawn regarding the ranking of each element towards the needs and strategic objectives. On the other hand, the sum of the values in each column shows how and to what extent the Demo projects tackle the needs identified from the Contract Authority, and indicates the prioritisation of the needs.

Table 6-2: Correlation Matrix: Methodological elements addressed by the projects

No	METHODOLOGICAL ELEMENTS ADDRESSED BY THE PROJECT	DEMO PROJECTS			TOTAL
		DEMO 1 OXFAM - GAZA	DEMO 2 ARIJ - ALAROUB	DEMO 3 PARC - ANIN	
1	Addresses a clearly identified priority problem, through an innovative solution that present interesting potential for replication and positive impact on water management and pollution prevention / reduction in the target countries	3	3	3	9
2a	Beyond the impact on water management and/or pollution reduction, the applications should to the maximum possible extent address one or several of the following added-value items: Creates job opportunities (especially for youth)	2	1	3	6
2b	Makes companies more competitive	2	2	1	5
2c	Increases water efficiency	2	3	2	7
2d	Enhances resilience to climate change	1	2	0	3
2e	Stimulates the local economy and promoting the sustainable use of local resources;	2	3	2	7
2f	Promotes the sustainable use of local resources	2	3	1	6
3	Has a clearly demonstrated and measurable direct impact at local level – without excluding Actions with a national scope. The direct involvement of local stakeholders is compulsory	3	3	2	8
4	Long-term sustainability, at institutional, technical, environmental and financial levels is addressed at all stages, from action design to implementation and after project completion	1	2	1	4
5	Presents a strong internal monitoring component, with dedicated resources and suitable indicators, in each action, so that results and impacts can be documented and disseminated in the most objective manner	3	2	2	7



No	METHODOLOGICAL ELEMENTS ADDRESSED BY THE PROJECT	DEMO PROJECTS			TOTAL
		DEMO 1 OXFAM - GAZA	DEMO 2 ARIJ - ALAROUB	DEMO 3 PARC - ANIN	
6	Is consistent with EU policies in the field of water management, as well as with the needs of the country where the project takes place	3	3	3	9
		24	27	21	



6.2 EVALUATION DESIGN AND DATA COLLECTION METHODS AND TOOLS

6.2.1 Guide for interviews with implementing partners/ project coordinators & beneficiaries

Project title:	
Date of the interview:	
Location of the interview:	
Name of the interviewer:	
Names and positions of the interviewees (e.g. project manager, coordinator, head of institution, etc.)	<ul style="list-style-type: none">■ ...■ ...

Discussion topics

The following topics are a combination of all topics for discussion during the interviews. Only the relevant issues were discussed with each interviewee, depending on the institution and the project(s) which fall under their areas of interest.

1. RELEVANCE AND QUALITY OF DESIGN

1. To what extent are the expected results and activities, assumptions and overall objectives still valid?
2. Have changes occurred in the project environment since project start (e.g. regulations/laws/ other needs) that have positively or negatively affected the relevance of the project?
3. How is the project addressing these external changes and is this reflected in the project planning?
4. To what extent have the needs of the country/local authority developed since the project started? How does the project intend to address these new needs?
5. Does the project still respond to the needs of the target groups? Do the planned target groups / beneficiaries correspond to the ones that are actually benefiting?
6. If applicable: How well did the project management adjust the project design (including the intervention logic / hierarchy of objectives) to make it more relevant?
7. Are project objectives clearly understood by all consortium partners and beneficiaries?
8. Are the project results achievable in the project framework?



2. EFFECTIVENESS TO-DATE

9. Is the project moving satisfactorily toward its stated objectives? Have all planned outcomes been achieved to date?
10. What is the quality of the outcomes/services available? How the assessment is done (if there is any)?
11. Has the target group benefited from the results? Are there any factors which prevent the target group accessing the results/services?
12. Are there any unplanned positive / negative effects on the target groups?
13. How good is the communication with the implementing partner and stakeholders? Do the stakeholders have access to the results of the project (formal arrangements, cooperation)?
14. Have you encountered any obstacles during the implementation?
15. Are corrective actions required and implemented?

3. EFFICIENCY OF IMPLEMENTATION TO DATE

16. Would it have been possible to organise actions/ implement interventions in a better way and, perhaps, more efficient?
17. Are timely and appropriate decisions being made to support effective implementation and problem resolution?
18. To what extent are activities implemented on schedule? Are there delays or deviation compared to the workplan? How can those be rectified?
19. Is an activity schedule (or work plan) and resource schedule available and is it also used by the project management?
20. Are beneficiaries participating in the reform process? How do they perceive project results?
21. Is an internal monitoring system in place, allowing cost-effective implementation of activities? Are activities monitored regularly by the project and corrective measures taken if required?
22. What is the quantity and quality of the results produced so far in comparison to the plans? Have all planned results been delivered to date? Is there concrete evidence of the achieved results?

4. IMPACT TO-DATE

23. Has the project resulted in changes in terms of management, individual behaviour, and has it brought benefits to beneficiaries/stakeholders? Can these be reasonably associated with the intervention?
24. Have any unintended and/or negative changes been produced?
25. Does the project disseminate new approaches which have an effect on restructuring?
26. Does the project serve as a model for the implementation of national reforms in its field?
27. Is the project contributing to the wider objectives set out in the original application? Are the wider planned effects being or are likely to be achieved?
28. Have any unintended and/or negative changes been produced? Did the project management take timely measures?
29. Have any unplanned positive effects been produced (consider the effects at the various levels: national/sector level; institutions; final beneficiaries)?



30. What opportunities are being created for the project beyond the specific objectives in particular in fields related to employability and enhanced cooperation?
31. Are the project results adequately promoted for creating a wider positive impact (dissemination)?
32. Is the project adapting well to external factors and coordinating well with other projects and donors?

5. SUSTAINABILITY

The focus is on how the positive effects will be maintained in the future, at the end of the programme. Consider sustainability and connectedness at different levels:

33. Social/institutional. Will the programme be culturally accepted, and how does it link to local capacities, power structures?
34. Economic. How will recurrent costs and future expenditures be covered; what is the effect on other economic activities?
35. Environmental. What are the short- and long-term environmental costs?

6. OTHER TOPICS

Publicity and awareness raising

- Effectiveness of the publicity and awareness raising actions conducted by the managers/coordinators
- Examples of positive/poor awareness raised on the beneficiaries and/or the target groups
- Quality appraisal of the publicity/awareness raising actions of the projects
- Dissemination of the project results (actions, efficiency)

Proposals and recommendations

- Projects' maturity for continuation
- Maturity and readiness of the wider socio-economic environment and decision makers for continuation of the implementation of similar projects under EU funding
- Proposals for concrete measures aiming at the improvement of the implementation

THEMES	DISCUSSION TOPICS
1 - Assessment of the implementation of policies and the consistency of the project objectives	<ul style="list-style-type: none">▪ Relevance and consistency of the project objectives▪ Deviation from the initial project targets▪ Problems and discontinuities of policies in the relevant fields of intervention of the project▪ Adequacy of the institutional framework for the implementation of policies in the relevant fields and the sustainability of the project's results▪ Communication and cooperation of stakeholders with decision makers
2 – Project's effectiveness	<ul style="list-style-type: none">▪ Effectiveness in the implementation of the financial and physical object of the project▪ Obstacles encountered during the implementation▪ Corrective actions required and implemented



THEMES	DISCUSSION TOPICS
3 - Competence and sufficiency of the beneficiaries and main problems encountered	<ul style="list-style-type: none">Managers' competence in project management in line with the project fiche' and the EU rules requirementsCorrective actions undertakenBeneficiaries' competence in project preparation and project management inActions of support and solving the problems of the beneficiaries and their efficiency
4 - Main difficulties	<ul style="list-style-type: none">Difficulties obstructing the smooth implementation of the project (technical competence, operational/legal framework, etc.)Difficulties faced by the beneficiaries (from the point of view of the managers and other coordinating institutions)
5 - Communication	<ul style="list-style-type: none">Communication and cooperation (internal and external, among partners and stakeholders, with the managers/coordinators, etc.)Proposals for corrective actions to improve communication and cooperation among all involved partiesProposals for improvement of the projects implementation procedures
6 - Good practices in the implementation of the projects	<ul style="list-style-type: none">Examples of good practices/poor practices in the process of the project implementationOpportunities exploited or with potential for further exploitation of the projects' results
7 - Publicity and awareness raising	<ul style="list-style-type: none">Effectiveness of the publicity and awareness raising actions conducted by the managers/coordinatorsExamples of positive/poor awareness raised on the beneficiaries and/or the target groupsQuality appraisal of the publicity/awareness raising actions of the projectsDissemination of the project results (actions, efficiency)
8 - Projects' added value	<ul style="list-style-type: none">Added value of projects implemented under Europeaid in comparison with projects implemented by other EU and other donor's interventionsSustainability of the project results (tangible and intangible results)Projects' innovations
9 – Future perspectives	<ul style="list-style-type: none">Projects' maturity for continuationMaturity and readiness of the wider socio-economic environment and decision makers for continuation of the implementation of similar projects under EuropeaidPriority areas of support from the point of view of the managers of Europeaid and the other coordinating institutions
10 - Proposals and recommendations	<ul style="list-style-type: none">Awareness on the priorities for support provided by Europeaid and eligibility of actions in the new programming period 2021-2027Proposals for concrete measures aiming at the improvement of the management of projects under Europeaid



6.2.2 Questionnaire filled by implementing partners

A. General information	
1. Project name:	
2. Contracting party:	
3. Contract number:	
4. Date and duration of the interview:	
5. Location of the interview:	
6. Name of the interviewer:	
7. Names and positions of the interviewees (e.g. project manager, coordinator, head of institution, etc.)	
8. Can you please summarise the main objectives, activities and expected results of your project?	
<i>Allow Interviewee to express views without prompting answers.</i>	
9. Area(s) of interventions <i>Several answers can be ticked</i>	
I. Enhancing effectiveness of local water resources governance;	<input type="checkbox"/>
II. Adapting and enhancing resilience to the water-related impacts of climate change;	<input type="checkbox"/>
III. Promoting water demand management, water efficiency and non-conventional water resources (in particular recycled and reclaimed water), and protecting water quality and the good ecological status of water bodies; ⁴⁴	<input type="checkbox"/>
IV. Optimising water financing and related instruments, with emphasis on innovative mechanisms at local level;	<input type="checkbox"/>
V. Improving the management of municipal waste, urban wastewater, and/or industrial emissions in order to minimize or prevent the release of pollutants in water bodies.	<input type="checkbox"/>
10. Type of main project's activity/ies <i>Several answers can be ticked</i>	
a) Assessments, surveys (field or desk) in order to define the baseline and the detailed technical design, evaluate the project outcomes and its sustainability in the local context	<input type="checkbox"/>

⁴⁴ The definition of ecological status takes into account specific aspects of the biological quality elements, for example, "composition and abundance of aquatic flora" or "composition, abundance and age structure of fish fauna".



b) Technical expertise for the implementation of the project	<input type="checkbox"/>
c) Preparation and production of communication / visibility / dissemination materials (except creating a project website) in order to raise awareness of stakeholders and to promote replication of the tested innovative solution(s);	<input type="checkbox"/>
d) Procurement, delivery and supervision of civil works, mechanical works	<input type="checkbox"/>
e) Procurement, delivery and supervision of services	<input type="checkbox"/>
f) Procurement of equipment and other material directly related to project's activities	<input type="checkbox"/>
g) Launching of new management practices	<input type="checkbox"/>
h) Developing water management strategies <i>Please specify which strategy/ies</i>	<input type="checkbox"/>
i) Workshops/ seminars/ courses	<input type="checkbox"/>
j) Individual support/counseling/providing information	<input type="checkbox"/>
k) Support services for vulnerable groups	<input type="checkbox"/>
l) Initiating targeted partnerships during the project/networking	<input type="checkbox"/>
m) Internal Project Monitoring	<input type="checkbox"/>
n) Other <i>Please specify</i>	<input type="checkbox"/>

B. Project development

11. How did you become aware of the call?

a) EU/EUO announcements/web pages	<input type="checkbox"/>
b) Government institutions (announcements/web pages)	<input type="checkbox"/>
c) Regional contacts	<input type="checkbox"/>
d) Consultancy firms	<input type="checkbox"/>
e) Chambers, foundations and other associations	<input type="checkbox"/>
f) Media publicity (radio, TV, press, etc.)	<input type="checkbox"/>
g) Word of Mouth	<input type="checkbox"/>
h) Other <i>Please specify</i>	

12. How did you identify your project needs? (only for grants) *Several answers can be ticked*



a) Own research	<input type="checkbox"/>				
b) Local market/target groups demand	<input type="checkbox"/>				
c) Observation of local situation/needs	<input type="checkbox"/>				
d) Needs expressed by individuals and organisations	<input type="checkbox"/>				
e) Consultants' support	<input type="checkbox"/>				
f) Developed to suit the Call for Proposals	<input type="checkbox"/>				
g) Other <i>Please specify</i>					
13. How was the project proposal prepared? (only for grants)					
a) By our organization's staff	<input type="checkbox"/>				
b) By external consultants	<input type="checkbox"/>				
c) With support of local authorities	<input type="checkbox"/>				
d) With the help of chambers, other professional associations	<input type="checkbox"/>				
e) By the support of colleagues at other organisations/institutions	<input type="checkbox"/>				
f) By external consultants	<input type="checkbox"/>				
g) Other <i>Please specify</i>					
14. Were there difficulties preparing the project proposal?	Yes <input type="checkbox"/>		No <input type="checkbox"/>		
<i>Allow Interviewee to express views without prompting answers.</i>					
15. Were you preparing project proposals before the announcement of the Grant Scheme? (only for grants)	Yes <input type="checkbox"/>		No <input type="checkbox"/>		
16. How would you self-assess your level of capacity to write a project before preparing it? (only for grants) <i>Only if the project proposal was not prepared by consultants</i>	Very low <input type="checkbox"/>	Somewhat low <input type="checkbox"/>	Average <input type="checkbox"/>	High <input type="checkbox"/>	Very high <input type="checkbox"/>
17. Was the time given sufficient for project preparation over the period	Yes <input type="checkbox"/>		No <input type="checkbox"/>		



for call for proposals? (only for grants)		
18. If NO, how was your project affected? (only for grants)		
19. How did you finance the co-funding requirement, if there was such? (only for grants) <i>Several answers can be ticked</i>		
a) From the organization's own resources	<input type="checkbox"/>	
b) Individual donations	<input type="checkbox"/>	
c) Institutional donations	<input type="checkbox"/>	
d) Bank credit/loan	<input type="checkbox"/>	
e) Other <i>Please specify</i>		
20. Does the project have coherence with other on-going public funded initiatives by the government, the EU or other externally funded donor programs in the sector or in the region in which the project is implemented?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Allow Interviewee to answer freely without prompting answers.</i>		
21. Are the project objectives justified in relation to the needs of the target group(s)?		
<i>Allow Interviewee to answer freely without prompting answers.</i>		
22. Are the project objectives as valid now as it they were before the project started?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Allow Interviewee to answer freely without prompting answers.</i>		
23. Has the nature of the project changed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
24. If YES, what were the causes?		
<i>Allow Interviewee to answer freely without prompting answers.</i>		
25. Have activities been updated in order to adapt to any changes that have occurred over the project's lifetime?		



Allow Interviewee to answer freely without prompting answers.

26. How did you and your organization adapt and cope with changing circumstances?

Allow Interviewee to answer freely without prompting answers.

27. Were there any internal resource/input problems due to the scope and scale of the project (financial, human and administrative resources)?

Yes ☐

No ☐

If the question is addressed to a grant beneficiary, the interviewer seeks to identify the absorption capacity of the organisation.

28. Was a risk analysis carried out before the project was implemented?

Yes ☐

No ☐

Don't know what that is ☐

29. Did you attend any project design workshop(s)? (only for grants)

a) Attended personally

☐

b) Others in organisation attended

☐

c) Did not attend workshops

☐

d) Did not attend as not aware of workshops

30. If you participated in project design workshop(s) how useful was it? (only for grants)

a) Not useful

☐

b) Somewhat useful

☐

c) Useful

☐

d) Dominantly useful

☐

e) Fully useful

☐

31. If not useful, what were the main reasons and how could such training be improved? (only for grants)

Allow Interviewee to answer freely.

**C. Partnership****32. Did you work with projects managed by the EU to Palestine before?**a) Yes ☐b) No ☐**33. Did you work with projects managed by other international donors to Palestine before?**a) Yes ☐b) No ☐**34. If YES, please list the most important ones****35. Did you work with your partners before? (only for grants)**a) We worked together before with all the partners ☐b) We worked before with part of the partners, others were new ☐c) We did not work with the partners before ☐d) Other *Please specify* ☐**36. In case you did NOT work before with the partners: How did you identify them and how did you approach them? (only for grants)***Allow Interviewee to express views without prompting answers.***37. To what degree the partners had a clear common interest? (only for grants)**Not at all
☐Not fully
☐Somewhat
☐Mostly
☐Fully
☐**38. To what degree the roles and responsibilities of the consortium members/partners were clearly defined?**Not at all
☐Not fully
☐Somewhat
☐Mostly
☐Fully
☐**39. How would you judge the cooperation with the consortium members/partners? Have all contributed according to the expectations?**Not at all
☐Not fully
☐Somewhat
☐Mostly
☐Fully
☐*Allow Interviewee to express views without prompting answers.*

**40. What were the key factors for success and/or challenges in the consortium/partnership?***Allow Interviewee to express views without prompting answers.***41. In case there are different types of partners (private, public and NGO), is there a difference in the fruitfulness of the cooperation between these types of institutions?***Allow Interviewee to express views without prompting answers.***42. Will the partnership with the project partners continue after the funding period? If yes, as a full consortium or with some partners individually? And for what type of activities? (only for grants)***Allow Interviewee to express views without prompting answers.***43. What would you advise other organisations in setting up a partnership? (only for grants)***Allow Interviewee to express views without prompting answers.***D. Project efficiency****44. Who is in charge of the day-by-day management of the project?**

a) In house staff (existing)	<input type="checkbox"/>
b) In house staff (newly appointed for this project)	<input type="checkbox"/>
c) External consultants	<input type="checkbox"/>
d) Other <i>Please specify</i>	

45. To what degree project management is done in coordination with the EU/Grant managing organisation?	Not at all <input type="checkbox"/>	Not fully <input type="checkbox"/>	Somewhat <input type="checkbox"/>	Mostly <input type="checkbox"/>	Fully <input type="checkbox"/>
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46. Is the project progressing on time and within the budget?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	There is a time extension <input type="checkbox"/>
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47. Has the budget for the project been adjusted and if so why and by how much?*Allow Interviewee to answer freely.***48. What in your opinion were the most difficult problems to overcome during implementation until now?**



<i>Several answers can be ticked</i>	
a) Budget not adequate	<input type="checkbox"/>
b) Not enough resources (human resources, equipment, ...)	<input type="checkbox"/>
c) Lack of cooperation from consortium members/partners	<input type="checkbox"/>
d) Cash flow difficulties	<input type="checkbox"/>
e) Delays on site	<input type="checkbox"/>
f) Political conditions	<input type="checkbox"/>
g) Availability of local experts	<input type="checkbox"/>
h) Complexity of rules and procedures – legislative and regulatory framework	<input type="checkbox"/>
i) Complexity of guidelines and reporting templates	<input type="checkbox"/>
j) VAT Exemption	<input type="checkbox"/>
k) Poor or misleading advice from the EU/Grant managing organisation	<input type="checkbox"/>
l) Poor relations with the EU/Grant managing organisation	<input type="checkbox"/>
m) Corresponding and reporting in English	<input type="checkbox"/>
n) Other <i>Please specify</i>	
49. Please elaborate in more detail your answer(s)	
<i>Allow Interviewee to answer freely.</i>	
50. How did you communicate to the Contracting Authority and how often over the duration of the project?	
<i>Allow Interviewee to answer freely.</i>	
51. How was the contribution of the EU operation managers in the implementation of the project?	
a) Very Useful	<input type="checkbox"/>
b) Useful	<input type="checkbox"/>
c) Somewhat useful	<input type="checkbox"/>



d) Not useful	<input type="checkbox"/>
e) Never met with technical assistance experts	<input type="checkbox"/>
52. How was the contribution of the technical assistance experts (if any) during your project implementation? (only for grants)	
a) Very Useful	<input type="checkbox"/>
b) Useful	<input type="checkbox"/>
c) Somewhat useful	<input type="checkbox"/>
d) Not useful	<input type="checkbox"/>
e) Never met with technical assistance experts	<input type="checkbox"/>
53. What methods and tools have you used to monitor, collect data and report results?	
<i>Allow Interviewee to answer freely.</i>	
54. How did the Contracting Authority support/contribute to the implementation of your activities until now?	
<i>Allow Interviewee to answer freely</i>	
E. Project effects	
55. Has (or will) the project achieve(d) its immediate targets and expected results?	Yes <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Too early to assess <input type="checkbox"/>
56. To what extent you consider that the results of your project have been achieved? <i>Indicate an approximate percentage</i>	
57. What are the immediate measurable results for your project? <i>Several answers can be ticked</i>	
a) Increased accessibility to water resources for targeted groups	<input type="checkbox"/>
b) Introduction to innovative, cost-saving technologies in water resources management for targeted groups	<input type="checkbox"/>
c) Increased numbers of employed	<input type="checkbox"/>
d) Social inclusion improved	<input type="checkbox"/>
e) Partnerships and collaboration at regional/local level enhanced	<input type="checkbox"/>
f) Other <i>Please specify</i>	



58. If NO results were achieved (or only partially) until now, explain the main reasons.				
<i>Allow Interviewee to answer freely.</i>				
59. Could more (or better) immediate results be obtained by other means?	Yes <input type="checkbox"/>		No <input type="checkbox"/>	
60. If yes, please explain?				
<i>Allow Interviewee to answer freely.</i>				
61. Have the objectives been achieved or will be achieved at the lowest cost and with best practices?	Yes <input type="checkbox"/>		No <input type="checkbox"/>	
<i>Allow Interviewee to answer freely.</i>				
62. Could better effects be obtained at the same cost?	Yes <input type="checkbox"/>		No <input type="checkbox"/>	
<i>Allow Interviewee to answer freely.</i>				
63. Were there any unplanned outputs arising from the implementation of the project activities? (Either positive or negative)	Yes <input type="checkbox"/>		No <input type="checkbox"/>	
<i>Allow Interviewee to answer freely.</i>				
F. Project impacts				
64. Are wider impacts as expected from the implementation of the project?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Partially <input type="checkbox"/>	Too early to assess <input type="checkbox"/>
65. Have the wider impacts achieved so far matched with the objectives, i.e. both in terms of quantity and quality?	Yes <input type="checkbox"/>		No <input type="checkbox"/>	
66. Please elaborate on the above answer with regard to the project's indicators.				
<i>Interviewer must have prior knowledge of the project OVIs but initially allow the interviewee to answer freely.</i>				
67. What contributed to the fulfilment of the objectives and expected results? <i>Several answers can be ticked and comments/explanations should be prompted for each answer</i>				
a) Good project management on behalf of the EU/Grant managing organisation	<input type="checkbox"/>	<i>Comments</i>		



b) Good coordination/support on behalf of the beneficiary institutions	<input type="checkbox"/>	<i>Comments</i>
c) Quality of the task managers of the EU/Grant managing organisation	<input type="checkbox"/>	<i>Comments</i>
d) Quality of project experts	<input type="checkbox"/>	<i>Comments</i>
e) Technical/consultancy assistance	<input type="checkbox"/>	<i>Comments</i>
f) Size of budget	<input type="checkbox"/>	<i>Comments</i>
g) Contribution of consortium members/partners (if any) involved	<input type="checkbox"/>	<i>Comments</i>
h) Local support (funds or in-kind)	<input type="checkbox"/>	<i>Comments</i>
i) EU/Grant managers support and monitoring	<input type="checkbox"/>	<i>Comments</i>
j) Publicity for project	<input type="checkbox"/>	<i>Comments</i>
k) Good project design	<input type="checkbox"/>	<i>Comments</i>
l) Other <i>Please specify</i>		<i>Comments</i>
68. Has your project contributed or is anticipated to contribute directly or indirectly to the wider socio-economic development priorities of Palestine? If so in what way? <i>Several answers can be ticked</i>		
a) Alleviated regional disparities	<input type="checkbox"/>	<i>Comments</i>
b) Economic diversification	<input type="checkbox"/>	<i>Comments</i>
c) Increased competitiveness	<input type="checkbox"/>	<i>Comments</i>
d) Social inclusion (gender, vulnerable groups, etc...)	<input type="checkbox"/>	<i>Comments</i>
e) Protection of environment	<input type="checkbox"/>	<i>Comments</i>
f) Increased living standards	<input type="checkbox"/>	<i>Comments</i>



g) Other <i>Please specify</i>		<i>Comments</i>	
h) No contribution	<input type="checkbox"/>	<i>Comments</i>	
G. Project sustainability			
69. Are (or do you consider) the results/impacts including improved institutional changes, durable over time?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
70. If YES, in what way?			
<i>Allow Interviewee to answer freely.</i>			
71. Will the project produce positive effects over time and at a similar or higher level?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
72. If YES, in what way?			
<i>Allow Interviewee to answer freely.</i>			
73. Will the impacts continue if there is NO more public funding?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
74. If YES, in what way?			
<i>Allow Interviewee to answer freely.</i>			
75. Has the project contributed or is anticipated to contribute to institutional capacity building?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
76. If YES, in what way?			
<i>Allow Interviewee to answer freely.</i>			
77. What experience(s) have you acquired during the implementation of this project that would be relevant for your current or future activities? (only for grants) <i>Several answers can be ticked</i>			
a) Expand your current activities	<input type="checkbox"/>		
b) Encouraged you to apply for similar Grant schemes	<input type="checkbox"/>		
c) Preparedness for other Grant schemes	<input type="checkbox"/>		
d) Invited by others to implement their schemes	<input type="checkbox"/>		
e) Always seek external technical assistance	<input type="checkbox"/>		
f) Other <i>Please specify</i>			



g) Not a positive experience		<input type="checkbox"/>	
78. If NOT a positive experience, please clarify the reasons (only for grants)			
<i>Allow Interviewee to answer freely.</i>			
79. Are you planning to use your experience in finding new financial sources for your organization? If yes, give examples (only for grants)			Yes <input type="checkbox"/> No <input type="checkbox"/>
<i>Allow Interviewee to answer freely.</i>			
80. Are you planning to apply to a similar call for proposals in future? (only for grants)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Don't know <input type="checkbox"/>
81. If NO, why? (only for grants)			
<i>Allow Interviewee to answer freely.</i>			
82. Are there any concrete plans to identify additional budgetary support for a similar project or to expand this project in future years? <i>Allow Interviewee to answer freely.</i>			
83. What are the most important factors for successful implementation of this Grant Scheme? (only for grants and for service contracts including management of Grant schemes) <i>Several answers can be ticked</i>			
a) Beneficiary managerial experience	<input type="checkbox"/>		
b) Beneficiary's motivation and commitment	<input type="checkbox"/>		
c) Understanding Grant Scheme criteria	<input type="checkbox"/>		
d) Quality of training for Grant Scheme applicants	<input type="checkbox"/>		
e) Previous similar experience	<input type="checkbox"/>		
f) Size of budget	<input type="checkbox"/>		
g) Payment schedules	<input type="checkbox"/>		
h) Quality of products/equipment procured	<input type="checkbox"/>		
i) Overall clarity of approach	<input type="checkbox"/>		
j) Other <i>Please specify</i>			
84. Is there anything additional information or comment that you would like to make with regard to the project preparation and implementation process?			
<i>Allow Interviewee to answer freely.</i>			



6.3 LIST OF PERSONS INTERVIEWED

Demo Project	Date	Meeting/Contact Type	Main interviewee/s	Other (Beneficiaries/Stakeholders)	Participants	Place	Object	Material Collected	Comments
ARIJ - PARC	24/7	Meeting	Jane Hilal, Project Manager); Salam Rihan (Project Manager)			Athens, Greece	Presentation of the demo projects; Initial discussion on the progress		
OXFAM	22/10	Skype call	Wassem Mushtaha (Program Manager)				Get more Information about the project and discuss the questionnaire		
ARIJ	27/10	Skype call	Jane Hilal (Head of Water & Environment Research Department Eng Ilyas (Engineer)				Get more information about the project and discuss the questionnaire		
ARIJ	10/11	Onsite visit	Jane Hilal, Project Manager; Ilyas (Engineer)	Mohamad Shaladeh (Sa'eer Municipality Director), Municipality Lawyer, Mohammad Almughraby, Aggie advisor Ministry of Agriculture	Mohamad Jaber Shaladha, Wadi AlAroub Farmers' representative; Shehda Alfrough, Municipality Engineer, Maher Shaladeh, aggie advisor, Municipality of Agriculture	Sa'eer Municipality project site at wadi AlAroub	Interviewing the Municipality director, farmers' representative, Municipality engineer, Municipality lawyer, and aggie advisors from MoA	Photos of the site and information related to DAC criteria	Listen to the farmers views about the project ; visiting the existing wastewater treatment plant and the lands to be used for irrigation
PARC	05/11	Onsite visit	Salam Rihan (Project Manager)			Jenin West Joint Service Council	Discussion on filled questionnaire and get more information about the project		
PARC	05/11	Onsite visit	Salam Rihan (Project Manager)	Muneer Jaradat, Jenin West JSC, Khalid Mahmoud, Site Engineer ; Municipality Lawyer, Mohammad AlMughraby, Aggie	Ayman Musa, PARC, Rabah Yaseen, Farmer; Baher Yaseen, Anin Village Councilor; Ahmad Fawzi, Farmer, Mohamad Yaseen, Farmer.	Jenin West Joint Service Council, and Project site in Anini	Interviewing farmers, project manager and stakeholders	Photos of the site and information related to DAC criteria	Meeting with the contractor while working on site and meeting with the farmers and hearing from residents about the work under construction. Getting



Demo Project	Date	Meeting/ Contact Type	Main interviewee/s	Other (Beneficiaries/ Stakeholders)	Participants	Place	Object	Material Collected	Comments
				advisor Ministry of Agriculture					more information from Jenin West JSC about expected difficulties in running the project once its is commenced
ARIJ-PARC	26/11	Onsite visit	Adel Yaseen (Director of Wastewater Sanitation Department PWA)	Adel Yaseen-PWA stakeholder		PWA		Information of the expected sustainability of the two Demos projects	Getting more information about Demos' progress and contribution of PWA towards the accomplishment of the projects.
OXFAM	17/12	Skype call	Wassem Mushtaha (Program Manager)				Discussion on specific findings from the documents provided to and the interviews (fieldwork) with various actors; conclusions coming after the first implementation phase; particular issues requiring action / corrective measures etc.; Remarks and suggestions for improvement in other related projects and programs		
ARIJ	18/12	Skype call	Jad Isaac (Director General) Jane Hilal ((Project Manager)						
PARC	18/12	Skype call	Salam Rihan (Project Manager)						''
EU	19/12	Skype call	Joao Anselmo (EU Program Manager)				Discussion on most significant findings from the discussions – contacts with the implementing partners and stakeholders, the problems encountered, the provisions built in and solutions adopted in the projects, as well as on recommendations for further action		



6.4 DEMO PROJECTS LOGFRAME MATRICES

6.4.1 Demo 1 (OXFAM): «Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip»

	Intervention logic	Indicators	Baseline	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
Overall objective: Impact	To contribute to more sustainable water and agricultural practices in Palestine through reducing land-based sources of marine pollution.	<p>Indicator 1 % reduction of partially treated wastewater being discharged into the sea from the Gaza Strip</p> <p>Indicator 2 % decrease of the ground water abstraction used for agricultural irrigation in the Gaza Strip</p>	<p>10,000 and 100,000 cubic meters discharged daily from Rafah and Gaza Strip respectively</p> <p>92.7 MCM Annually</p>		<p>10% reduction in discharge to sea from Rafah, 5% reduction on Gaza strip level</p> <p>0.5% decrease in ground water abstraction for agricultural use</p>	<p>PWA, Municipalities and CMWU reports Baseline and End-line survey reports.</p> <p>PWA, MoA, Municipalities and CMWU reports Baseline and End-line survey reports.</p>	<p>There is a strong and sustained high-level government commitment from the Palestinian Water Authority (PWA) and Coastal Municipalities Water Utility (CMWU) and Ministry of Agriculture (MoA) to promote and support the re-use of wastewater in agriculture in the Palestine Territories. CMWU have the capacity to monitor the quantities of discharged waste water to the sea</p>
Specific objective(s): Outcome(s)	To strengthen integrated water resource management in the Gaza strip through innovative environmental and agricultural solutions in southern Gaza (Rafah and Khan Younis Governorates).	<p>Indicator 1.1 % targeted lands have improved access to safe and affordable water resources through using TWW for irrigation</p>	2016 rapid assessment shows no access in the target area.		90% of targeted farmers reported improved access of their lands (200 dunums) to safe and affordable water	<p>Baseline and end line survey associated with questionnaire and farmers satisfactions</p> <p>Comparison between crops yields of TWW irrigated lands with the crops of lands irrigated conventionally Daily flow rate calculations</p>	<p>Sufficient local staff capacity and understanding is available to monitor, update baseline information and take action on the findings.</p> <p>There is also strong assumption that significant number of farmers will accept to use affordable TWW</p> <p>There is sufficient local capacity to manage and implement demonstration projects and to facilitate stakeholder involvement in these projects. Stakeholders are able to fully understand the issues associated with wastewater re-</p>



	Intervention logic	Indicators	Baseline	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
							use, and are able and willing to to promote its use.
		Indicator 1.2 % of targeted men and women farmers using TWW for agricultural irrigation	No current access to TWW.		90% of targeted farmers(men and women) in the 200 dunums	Base line and end line survey report Farmers interviews	Stakeholders are able to fully understand the issues associated with wastewater re-use, and are able and willing to to promote its use.
		Indicator 1.3 % of partially treated wastewater being re-treated and used for agricultural irrigation	No water currently being re-treated.		10% of Rafah wastewater plant production	Baseline and end-line survey reports. Municipalities and CMWU reports	As above, stakeholder willingness and capacity. Ability to procure materials required for establishment of post-treatment processes.
		Indicator 1.4: % of males and female farmers are supporting WWT model scaling up and replication	N/A		40% of (fruitful and fodder crops) in Al-Mawasy farmers (men and women)	Base line and end line survey report Farmers interviews	Stakeholders are able to fully understand the issues associated with wastewater re-use, and are able and willing to to promote its use.
Outputs	Output 1: 200 dunums of productive agricultural land have been irrigated by reuse of TWW through an innovative and sustainable waste water treatment and irrigation system	Indicator 1.1.1 # dunums of agricultural land irrigated using treated waste water	There is no land irrigated by TWW in Al-Mawasy area		200 dunums	Progress reports during the implementation phase Maps of irrigated agricultural lands	Local contractors have the capacity and experiences to construct the WWT system Sufficient knowledge and experiences enable project partners to design and monitor the construction
		Indicator 1.1.2 A fit-for-purpose treated waste water reuse irrigation system has been constructed and is operational	Not currently operational		7 km mains distribution line One reservoir (3600 m ³)	Regular construction progress reports from contractors and partners during construction phase	
		Indicator 1.1.3 % targeted farms (in Donums) have functional irrigation systems	To be collected in the baseline		100% of targeted farms have functional irrigation systems	Farmers feedback Focus group discussions Quarterly progress reports on % farmers operating the irrigation system End line evaluation report	



	Intervention logic	Indicators	Baseline	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
		Indicator 1.1.4 # m3 of TWW pumped daily to agricultural lands	Target area: 0 m ³		2000 m ³	Operational monthly treatment plants reports produced by CMWU Flow rate calculations	
	Output 2: Wastewater re-use management has been institutionalized through development and activation of a legal framework and governance model that includes a sustainable and equitable tariff system	Indicator 2.1.1 An institutional unit for wastewater treatment reuse has been established with clear roles and responsibilities (WWRU)	There is no TWWU		One established and functional unit with 20% women representation	Quarterly progress report Workshops reports Minutes of meetings Approved legal framework document Attendance sheets	Existing WASH consultation and coordination mechanisms are functioning effectively. Men and women farmers have willingness to establish their own reorientation body CMWU have the capacity to manage TWW tariff system
		Indicator 2.1.2 A Committee/ association of wastewater users has been established with clear roles and responsibilities and connected to the WWRU	There is no committee		One established and functional committee with 20% women representation	Quarterly progress report Workshops reports Minutes of meetings Approved legal framework document Attendance sheets	
		Indicator 2.1.3 % of farmers committed to the TWW tariff conditions	N/A		80% of targeted farmers (men and women)	Baseline/end line survey Municipal tariff system report Focus group discussions with women Focus group discussions with Men	
	Output 3: A monitoring and verification system for the full treatment and reuse cycle, from soil through to product quality monitoring, has been established and activated.	Indicator 3.1.1 A clear monitoring strategy has been developed and approved to follow up waste water reuse system from source to the produced crops	N/A		One approved document	Approved monitoring strategy Farmers FGDs WWRU FGD	Local Labs/service providers have the capacity to test water, soil, and products PEF are able to manage their own water testing Lab All stakeholders have the interest to establish monitoring and verification system
		Indicator 3.1.2 All waste water received by farmers are within acceptable standards	There is no product to be tested during at baseline		100%	Quarterly wastewater samples testing – chemical and biological	



	Intervention logic	Indicators	Baseline	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
		PWA for irrigation purposes					
		Indicator 3.1.3 % of farmers and workers who are compliant with the monitoring and verification system and procedures	This will be addressed in the baseline study after the establishment of monitoring and verification system		60% of men and women farmers	Baseline, mid-term and end line survey Signed Memorandum of Understanding with farmers	
	Output 4: A replicable model for TWW re-use for agricultural irrigation has been developed and evaluated	Indicator 4.1.1 # of other (not targeted) farmers are supporting WWT model replication at their lands (both women and men famers)	NA		50 farmers of about 100 Donums of land	Baseline and end line KAP survey Women FGDs Men FGDs	Mechanisms and approaches to capture lessons are appropriate and facilitate promotion of replication
		Indicator 4.12 # of monitoring and evaluation and dissemination events conducted to promote the replication of TWW reuse	0		4 events including 50% women participation	Events/workshops reports Events attendance sheets	
	Output 5: Acceptance of using TWW for agriculture irrigation has been generated among farmers and consumers	Indicator 5.1.1 # workshops and # men and women awareness sessions conducted to raise public awareness to accept and use TWW irrigated products	N/A		20 workshops 250 men sessions 250 women sessions	Workshops reports Sessions reports Attendance sheets	The community is highly trusting and respecting Oxfam and its partners in Al-Mawasy area due to previous successful projects
		Indicator 5.1.2 % of men and women surveyed in the target area	N/A		60% of surveyed people(men and	End line questionnaire	



	Intervention logic	Indicators	Baseline	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
		reported their participation in workshops and sessions about safety of using TWW in irrigation			women) in Al-Mawasy area		
		Indicator 5.1.3 % of men and women surveyed in the target area who showed willingness to consume products irrigated with TWW	To be collected in Al-Mawasy area		60% of surveyed men and women in Al-Mwasy area	End line KAP questionnaire	
		Indicator 5.1.4 % of men and women farmers who reported that their TWW irrigated products have been sold direct to consumers	While there are no products yet, the baseline is not valid or 0		60% of targeted men and women farmers	Post-harvesting questionnaire Farmers FGDs	



6.4.2 Demo 2 (ARIJ): «Promote wastewater treatment and reuse in the water scarce areas of the Middle East & North Africa through development and demonstration of innovative instruments and inclusive management plants»

	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
Overall objective: Impact	To promote wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa (MENA) by developing scalable and innovative financial instruments and inclusive management plans that can fully recover the costs of wastewater treatment and reuse at a demonstration site in Wadi Al-Aroub, Palestine	<p>1. All revenue streams from polluters and beneficiaries from treated wastewater reuse products are realized including the reuse of compost and treated wastewater.</p> <p>2. Full cost recovery of the O&M costs of wastewater treatment. 3. A model for the sustainable operation of wastewater treatment is demonstrated and disseminated to planners, decision makers, and the scientific community.</p>	<p>1. Only one revenue stream (polluter pays principal) is realized covering only 35% of plant O&M costs.</p> <p>2. Current cost of wastewater treatment is 0.4 EUR/m³ which is unsustainable. 3. Most WWTPs in the MENA operate at a deficit and are subsidized by governments.</p>	<p>1. Average cost of wastewater treatment in the MENA estimated in 2010 to range between 0.38 and 0.58 US\$/m³.</p> <p>2. Sludge management costs range between 20-60% of total WWTP operational costs. 3. In MENA, There are no examples -we are aware of - of using renewable energy to operate WWTP.</p>	<p>1. By 2019, achieve full O&M costs recovery (cost of treating wastewater is 0 EUR/m³) when accounting for PV and sludge management savings and revenues from pollutes and sales of treated wastewater. 2. Composting facility cash flows and payback period attracts the private sector investment. 3. PV system cash flows and payback period convinces authorities of the value of investment.</p>	<p>1. Project cost efficiencies and actual financial cash flows reports. 2. Replication of the action or components (e.g. sludge composting, PV system, etc.) at national level and in the MENA region (Sources of verification include national Status of Environment Reports, International development Agencies reports)</p>	
Specific objective(s): come(s)	<p>Oc 1: Demonstrate the feasibility of reducing the operational costs of wastewater treatment (Specific objective 1 in the concept note) using innovative and cost-efficient technologies of energy production and sludge management</p> <p>Oc 2.1: Gain economic advantages for farmers by</p>	<p>Changes in energy cost of wastewater treatment (EUR/m³); Changes in sludge management costs (EUR/m³); Changes in total cost of wastewater treatment (EUR/m³)</p> <p>Volume of treated wastewater used in</p>	<p>Energy cost = 0.13 EUR/m³; Sludge management cost = 0.17 EUR/m³; Total cost = 0.4 EUR/m³</p> <p>Volume reused = 0m³; Farmer net</p>	<p>Baseline year 2016 (Jan-Jul). Energy cost = 0.13 EUR/m³; Sludge management cost = 0.17 EUR/m³; Total cost = 0.4 EUR/m³</p>	<p>Reference year 2019. Energy Cost = 0.06 EUR/m³; Sludge management = (0-0.034 EUR/m³); Total cost of treatment = (0.2 – 0.205 EUR/m³)</p>	<p>Project cost efficiencies and actual financial cash flow reports for the PV system and the WWTP.</p>	<p>The PV system is installed and operational, the sludge-compost facility is recovering at least 80% of its operating costs through sales of compost.</p>



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
	<p>introducing innovative irrigation practices and nutrient management that enhance water productivity while also reducing environmental burdens.</p> <p>Oc 2.2: Increase the sense of ownership of the local community in the water resource and infrastructure.</p> <p>Oc 2.3: Promote the sustainable operation of the wastewater treatment plant by recovering some of the O&M costs from the sales of the treated wastewater</p> <p>Oc 3.1: Enhancing organizational, technical, financial and business capacities of the local agricultural cooperative qualifying it to manage treated wastewater distribution and reuse scheme</p> <p>Oc 3.2: Develop the capacity of the sludge-composting facility operator to manage the dewatering and composting facility</p> <p>Oc 4: Improve the quality, pricing, and marketability of agricultural commodities and compost</p>	<p>irrigation (m³); Farmer net revenue (EUR/ha); Soil organic C (%) and N-P nutrient levels (mg N/Kg soil); % of farmers using an irrigation DSS.</p> <p>Number of farmers contributing 30% of total cost of the subsurface Drip irrigation system (#).</p> <p>% of O&M costs recovered from sales of treated wastewater to cooperative.</p> <p>Management, financial, and technical skills sufficiently developed to Generate sufficient income to cover the O&M costs of the irrigation infrastructure (EUR).</p> <p>Human Pathogen counts; Volume of compost sold (m³); Sales Price of compost (EUR/m³)</p> <p>% from total production of AG produce sold directly to consumer cooperatives, social markets, and fair trade organizations. %</p>	<p>revenue = 4000EUR/ha; Profit margin = 23%; Soil C and N-P = To be determined from lab measurements. % of farmers using an irrigation DSS = 0%. AG lands are not currently irrigated- Dependence on erratic rainfall</p> <p>% of O&M costs recovered = 0%</p> <p>Existing management, financial, and technical skills are insufficient.</p> <p>Compost from Municipal waste facilities is sold in bulk at 23 EUR/m³</p> <p>As of 2015. Less than 6% of almond crop is sold directly to consumer</p>	<p>Baseline year 2016. Farmer net revenue = 4000EUR/ha; Soil C and N-P = To be determined from lab measurement s. % of farmers using an irrigation DSS = 0%. As of 2016. AG lands are not currently irrigated- Dependence on erratic rainfall As of 2016. % of O&M costs recovered = 0%</p> <p>As of Aug. 2016. Existing management, financial, and technical skills are insufficient.</p> <p>As of Aug. 2016. Compost from Municipal waste facilities is sold in bulk at 23 EUR/m³</p>	<p>Reference Year 2019. Net revenue = (12,000-16,000 EUR/ha); Improvements in soil C, N, and P soil concentration (increases in soil fertility) ; DSS usage > 50%.</p> <p>By end of 2018; 100 farmers have installed an SDI and contributed 30% of the total cost. By 2019; 35% of WWTP O&M costs are recovered (~31.5 thousand EUR)</p> <p>By 2019: Generate gross revenue of at least 65,000 EUR/yr.</p> <p>By end of 2018. No detectable levels of human pathogens. Volume of compost sold = 3,515m³/yr; sales price = 17 EUR/m³</p> <p>By 2019; more than 25% of AG product sold</p>	<p>Financial cash flow reports for agricultural cooperative. Volume of sales; cost of agricultural inputs. Survey of % of farmers using the DSS.</p> <p>Number of metered connections to the main irrigation line.</p> <p>Financial cash flow reports of WWTP.</p> <p>Agricultural cooperatives annual cash flow statement.</p> <p>Lab tests. Operator cash flow statements.</p> <p>Data collected by AG extension agents. Meetings with farmers and book records of AG cooperative.</p>	<p>The irrigation infrastructure is installed; farmers' willingness to pay 0.3 EUR/m³ of treated wastewater; farmers understand the value of using the DSS.</p> <p>Farmers are willing to invest 2000 EUR/ha to install the irrigation system (A farmer with 0.2 ha will invest 400 EUR) 37 ha of land cultivated; commitment of farmers to pay water bills.</p> <p>Volume of water used in AG is 220,000 m³/year (52% of the generated treated wastewater).</p> <p>Awareness campaign reduces public objection to purchasing sludge-compost. Marketing campaign generates sufficient demand for sludge-compost.</p> <p>Farmers' willingness to accept short term losses in AG</p>



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
		reduction in cost of insecticides/pesticides and inorganic fertilizers.	cooperatives. No comparable data is available for alfalfa hay. 55% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers.	As of 2015. Less than 6% of almond crop is sold directly to consumer cooperatives. No comparable data is available for alfalfa hay. 55% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers.	directly to consumer cooperatives, social markets, and fair trade organizations. A maximum of 25% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers.		production due to insect damage.
Outputs	<p>Op 1.1. (related to Oc 1): Generating 50% of WWTP energy requirements at a fraction (37.5%) of the retail cost of electricity</p> <p>Op 1.2. (related to Oc 1): Reduce the current cost of sludge management by at least 80% through composting and marketing of good quality composted sludge</p> <p>Op 1.3. (related to Oc 1): Reducing the average cost of wastewater treatment from 0.4 EUR/m³ to 0.2 EUR/m³</p> <p>Op 1.4. (related to Oc 1): Protection of the environment by conversion of destabilized sludge into a marketable product that can be safely used to</p>	<p>mWh of renewable electricity produced per year. % reduction in cost per kWh produced after accounting for depreciation, maintenance and operation costs = 37.5% Changes in sludge management costs (EUR/m³)</p> <p>Changes in total cost of wastewater treatment (EUR/m³)</p> <p>Changes in organic C content; No detectable levels of human pathogens in soil.</p>	<p>0 mWh/year; cost from grid = 0.16 EUR/kWh</p> <p>Current sludge management cost = 0.17 EUR/m³ of treated wastewater</p> <p>Current total cost = 0.4 EUR/m³</p> <p>Samples collected but Lab tests not performed yet</p> <p>0</p>	<p>0 mWh/year. cost from grid = 0.16 EUR/kWh</p> <p>Current sludge management cost = 0.17 EUR/m³ of treated wastewater</p> <p>Current total cost = 0.4 EUR/m³</p> <p>Samples collected but Lab tests not performed yet</p> <p>0</p>	<p>200 mWh/year. Total cost of 1 kWh from PV system = .06 EUR</p> <p>By 2018; Sludge management cost = (0-0.034 EUR/m³)</p> <p>Total cost of treatment = (0.2 – 0.205 EUR/m³)</p> <p>Organic C content increase by 10% /year; Human pathogens are not detectable in lab tests.</p>	<p>Actual PV system cost and financial cash flow report after 1 year of operation.</p> <p>Actual dewatering-composting system costs and financial cash flow report 1 year of operation.</p> <p>Same as above</p> <p>Lab tests</p> <p>Project annual reports</p>	<p>NA</p> <p>The sludge-compost facility is recovering at least 80% of its operating costs through sales of compost.</p> <p>Same as above.</p> <p>NA</p> <p>Farmers are willing to invest 2000 EUR/ha to install the irrigation system (A farmer with 0.2 ha will invest 400 EUR)</p>



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
	<p>improve the physical and chemical characteristics of soils in rangelands and croplands</p> <p>Op 2.1. (related to Oc 2): A cost-saving and water efficient irrigation system is installed and operational</p> <p>Op 2.2. (related to Oc 2): Economic water productivity is increased by at least 25% from increases in water use efficiency, reductions in the cost of agricultural inputs.</p> <p>Op 2.3. (related to Oc 2): 7.7ha of land rehabilitated and reclaimed for agriculture</p> <p>Op 2.4. (related to Oc 2): 7,400 tons/yr of 12% by moisture hay and 54.6 tons/year of dry nut fruits produced</p> <p>Op 2.5. (related to Oc 2): Transfer of ownership and management of the water reuse scheme to the local agricultural cooperative</p>	<p>Number of farmers installing SDI system</p> <p>Water productivity (WP)</p> <p>Reduction in soil EC (dsm⁻¹)</p> <p>Yield of dry hay per ha (metric ton/ha/year); yield of dry nut fruits (mostly almonds) (metric ton/ha/year)</p> <p>Agricultural cooperative is managing the irrigation system. Treated wastewater purchase agreement is signed with PWA</p> <p>Ownership transferred to Saiir Municipality. Saiir Municipality signs a public-private partnership agreement with a private sector operator.</p> <p>Human Pathogen counts; pH; and chemical tests.</p>	<p>Will be determined using control experiments with flood irrigation in 2016 at research field. Soil samples collected awaiting lab results.</p> <p>0 ton dry hay; almond production = 2,000 kg/ha/year</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p>	<p>Will be determined using control experiments with flood irrigation in 2016 at research field. Soil samples collected awaiting lab results.</p> <p>0 ton dry hay; almond production = 2,000 kg/ha/year</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p>	<p>80-100 farmers</p> <p>At least 25% increase in WP</p> <p>EC level below 14.9 (dsm⁻¹)</p> <p>Alfalfa yield = 37 ton/ha/year; almond yield = 3,900 kg/ha/year.</p> <p>By late 2018; early 2019; the AG cooperative owns and manages the irrigation system (reservoir-pumps-main irrigation line). Treated wastewater purchase agreement is signed with PWA.</p> <p>By early 2018. Ownership is transferred and facility is operated</p>	<p>Experimental research results reported in annual project report; peer reviewed article.</p> <p>Lab tests</p> <p>Sales volumes from farmer and cooperative book keeping.</p> <p>Legal ownership transfer papers and purchase/distribution agreement.</p> <p>Legal ownership transfer papers. PPP agreement signed between parties.</p> <p>Lab tests</p> <p>Agricultural cooperatives annual cash flow statements.</p>	<p>Based on published literature.</p> <p>Leaching soils with treated wastewater combined with precipitation will reduce EC to acceptable levels. Installation of SDI; irrigation of 37 ha of land.</p> <p>AG cooperative members are sufficiently trained to manage the irrigation system.</p> <p>Compost facility is profitable.</p> <p>Compost facility staff are well trained.</p> <p>Management, financial, and technical skills sufficiently developed. Volume of water used in AG</p>



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
	<p>Op 3.1. (related to Oc 3): The sustainable operation and maintenance of the dewatering and composting facilities</p> <p>Op 3.2. (related to Oc 3): The quality of compost in terms of its pathogen loads, chemical and structural properties is maintained after the transition of ownership</p> <p>Op 3.3. (related to Oc 3): The sustainable operation and maintenance of the irrigation infrastructure</p> <p>Op 3.4. (related to Oc 3): Maintain the economic and water use efficiency of the treated wastewater</p> <p>Op 4.1. (related to Oc 4): Increase resource-poor farmer profitability from sales of better quality agricultural products to consumer cooperatives and fair trade organizations</p>	<p>AG cooperative generates sufficient income to cover the O&M costs of the irrigation infrastructure (EUR).</p> <p>SDI system maintenance costs (EUR)</p> <p>% from total production of AG produce sold directly to consumer cooperatives, social markets, and fair trade organizations. % reduction in cost of insecticides/pesticides and inorganic fertilizers.</p> <p>Volume of compost sold at 17 EUR/m³ (m³)</p>	<p>As of 2015. Less than 6% of almond crop is sold directly to consumer cooperatives. No comparable data is available for alfalfa hay. 55% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers.</p> <p>Compost from Municipal waste facilities is sold in bulk at 23 EUR/m³</p>	<p>NA</p> <p>As of 2015. Less than 6% of almond crop is sold directly to consumer cooperatives. No comparable data is available for alfalfa hay. 55% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers. As of Aug. 2016. Compost from Municipal waste facilities is sold in bulk at 23 EUR/m³</p>	<p>by a private sector operator</p> <p>pH = 5-9; No detectable pathogen levels; C/N ratio around 12:1</p> <p>By 2019: Generate gross revenue of at least 65,000 EUR/yr.</p> <p>No maintenance required for 15 years if system is properly managed.</p> <p>By 2019; more than 25% of AG product sold directly to consumer cooperatives, social markets, and fair trade organizations. A maximum of 25% of total AG input costs are spent on insecticides, pesticides, and inorganic fertilizers.</p> <p>By end of 2018. No detectable levels of human pathogens. Volume of compost sold = 3,515m³/yr;</p>	<p>Farmer interviews</p> <p>Data collected by AG extension agents. Meetings with farmers and book records of AG cooperative.</p> <p>Operator cash flow statements</p>	<p>is 220,000 m³/year (52% of the generated treated wastewater). Farmers technical skills to manage the SDI are sufficiently developed.</p> <p>Farmers' willingness to accept short term losses in AG production due to insect damage. Intermediate market demand for produce.</p> <p>Product safety is demonstrated. People aware of product safety and use of product in neighbouring Islamic countries. Marketing campaign increases demand.</p>



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
	Op 4.2. (related to Oc 4): Increase market demand for the sludge compost				sales price = 17 EUR/m ³		



6.4.3 Demo 3 (PARC): «Innovative Demonstrations on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank»

	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
Overall objective: Impact	To contribute in improving sustainable water and environment management through promoting sustainable and innovative wastewater management systems and reuse schemes in Palestine.	access to additional non-conventional & sustainable water resources ensured New innovative wastewater treatment introduced (Sequential Batch Reactors) rural community level integrated with green energy	Less than 1% (PWA, 2016) Zero (PWA, 2016)	Less than 1% (PWA, 2016) Zero (PWA, 2016)	Slight additional access (PARC, 2019) One self-sustaining model introduced (PARC, 2019)	Palestinian Water Authority (PWA) Strategy, Ministry of Agriculture (MoA) Strategy, PARC & partner's strategies,	Policies in place encourage the use of treated wastewater effluent for agricultural purposes High cooperation with related ministries
Specific objective(s): Outcome(s)	Oc 1 : To create and disseminate innovative solutions in managing wastewater treatment and reuse in a sustainable socio-economic manner, thereby contributing to reduce wastewater pollution, improve food security conditions and ensure access to non-conventional additional water resources for agricultural purposes in the targeted rural area in West Bank -Palestine.	<ul style="list-style-type: none"> - Quantities (m³/year) of domestic wastewater (WW) (pollutants) became treated, available and accessible for agricultural reuse. - The health, socio-economic & environmental hazards of discharging untreated WW into open environment and groundwater is eliminated - # of farmers are now practicing Irrigated agriculture using treated WW - Additional # tons of agricultural products are produced annually through irrigated agriculture using treated WW. 	Zero treatment Zero Reuse (PWA, 2016) 100% (PWA, 2016) Zero Farmers (MoA, 2016) Zero Farmers (MoA, 2016)	Zero treatment Zero Reuse (PWA, 2016) 100% (PWA, 2016) Zero Farmers (MoA, 2016) Zero Farmers (MoA, 2016)	Around 105,000 m ³ /year of WW treated and reused (PARC, 2019) Eliminated to Zero (PARC, 2019) 50 Farmers (134 females, 140 males) (PARC, 2019) 10 tons (PARC, 2019)	Baseline survey, Data collection from the beneficiary log books, external evaluation final report, field visits and photos, record of treated wastewater meter	Policies in place encourage the use of treated wastewater effluent for agricultural purposes



	Intervention logic	Indicators	Baseline (incl. reference year)	Current value Reference date	Targets (incl. reference year)	Sources and means of verification	Assumptions
Outputs	Op 1.1.: Management of rural wastewater and environment improved in a sustainable and socio-economic manner.	Percent of Anin inhabitants are served by proper, safe, sufficient and innovative sanitation system.	Zero inhabitants (PWA, 2016)	Zero inhabitants (PWA, 2016)	Over 60% of 4,700 inhabitants) - (1,310 females, 1,510 males) inhabitants (PARC, 2019)	Data collection from the beneficiary, external evaluation final report, conducting of field visits and photos and farmers records.	Acceptance of farmers to use reclaimed wastewater is ensured Reclaimed wastewater fulfil Palestinian standards and guidelines for reuse Systems are modular and can be adapted to future population growth commitment of the village councils technicians and responsible is respected
	Op 1.2: Adaptation and resilience of rural farmers in the targeted village to water related impact of climate change is enhanced through promoting the demand and access to additional water resources and irrigated area for agricultural purposes using reclaimed wastewater.	Percent of saving in operational power consumption by using green energy (Solar panel).	Zero (PWA, 2016)	Zero (PWA, 2016)	50% saving in power energy consumption	Village councils reports, farmers log books, external evaluation final report and photos	
		# of dunums are shifted from rain-fed to irrigated lands, equipped with sufficient irrigation system and irrigated by suitable treated WW.	Zero Dunums (MoA, 2016)	Zero Dunums (MoA, 2016)	400 Dunums (PARC, 2019)		
	Op 1.3.: Awareness, technical and institutional capacity of farmers groups, public service providers, local and regional authorities are enhanced in the field of wastewater treatment and reuse.	Additional quantities (m ³ /day) of treated wastewater became treated, suitable and available for irrigation according to national standard.	Zero m ³ /day (PWA & MoA 2016)	Zero m ³ /day (PWA & MoA 2016)	290 m ³ /day (PARC, 2019)	Attendance sheet and training course closing report, training outlines, external evaluation final report and photos.	
		# of school students (about 300) targeted by different environmental (WW) awareness activities.	Zero students (MoE, 2016)	Zero students (MoE, 2016)	1,160 (580 girls, 580 boys) (PARC, 2019)		
		# of persons (technicians, inhabitants, farmers) trained in the targeted communities.	Zero persons (PWA & MoA, 2016)	Zero persons (PWA & MoA, 2016)	160 (50females, 110 males) (PARC, 2019)		
		# (women & men) are organized and registered in water governance body (Water Users Association)	Zero persons (PWA & MoA, 2016)	Zero persons (PWA & MoA, 2016)	30 (10females, 20 males) (PARC, 2019)		



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