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**Mediterranean Integrated System for
Water Supply «MEDISS»
Agreement No: A_B.4.1_0249**

WP3 activities

Final Technical Report



ENAS Sardegna

Edited by Enas



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CONTEXT

KEY INFORMATION

Name: MEDISS (Mediterranean Integrated System for Water Supply) is one of the project financed by the ENI CBC Med.

Thematic objective: B.4 Environmental protection, climate change adaptation and mitigation

Priority: B.4.1 Water efficiency

Countries: Palestine, Italy, Jordan, Tunisia

Total budget: 2.4 million (2.2 million EU contribution, 10% Project co-financing)

MEDISS “Mediterranean Integrated System for water Supply” is a project financed by the *ENI CBC MED Program: Cooperation across borders in the Mediterranean*, thematic “B.4 Environmental protection, climate change adaptation and mitigation” with priority “B.4.1 Water efficiency”. Six partners are involved in the project: Palestinian Wastewater Engineers Group and Jericho authorities (Palestine), Aqaba Water Company (Jordan), Institute des Regions Arides (Tunisia), CRENoS and Enas with the local stakeholders Cooperativa Produttori Arborea, Municipality of Arborea (Italy).

Project Areas of Intervention

To help address the problems of the Mediterranean areas involved in the project, MEDISS has experimented new innovative solutions. In particular:

- In Palestine (Jordan Valley) MEDISS is collecting lost surface water in Wadi Quilt, blending it with saline water from artesian wells and Treated Waste Water from Jericho city and then using it to irrigate pilot areas;
- In Jordan (Governorate of Aqaba) innovative approach never tested before in the Middle East is applied to the reverse osmosis (RO) desalination plant of brackish groundwater, extending membrane’s lifetime with innovative treatments and using photovoltaic (PV) panels for energy supply. Water is then used both for irrigation (1,4 ha) and domestic use by local inhabitants
- In Tunisia (Gabes) MEDISS has developed existing pilot plant (8 ha) for tertiary treatment through infiltration percolation, and tested an innovative filter bed of clay;
- In Italy (Arborea) MEDISS has developed a prototype for ammonia stripping from waste sludge, in a plant equipped with biogas cogeneration producing electricity and heat and contributing to the support of the plant itself.

The results and lessons learnt are the subject of MED-level communication and dissemination activities with an ad hoc communication strategy to facilitate transfer and capitalization in other countries and in other sectors. In the long term, the project will contribute to a sustainable water balance in MEDISS areas, increasing resilience to water stress and climate change. The pressure on primary water resources and the costs for water supply will be reduced. Local communities and institutions will benefit from the results of the project thanks to the network of professionals / experts of the MEDISS Project that, from the very beginning, are facilitating the exchange of experiences and good practices in the international area.

Project Duration: 36 months/ 3 years, the period between 2019 and 2022 (extended February 2023).

Financial data: MEDISS total budget: 2.4 million (EU contribution 2.2 million - 10% Project co-financing)

OBJECTIVES

WHAT HAS BEEN IMPROVED?

The project aimed to address the issue of improving the quality of saline groundwater present in the MED area opening up alternative irrigation for higher quality and more diversified cultivations.

Specific Objectives are threefold:

- To reduce water and soil salinity through non-conventional water supply, reduce stress on groundwater and enabling high productivity and diversification of agricultural production;
- To support non-conventional water solutions for agricultural use, to reduce water consumption and limit costs for water supply and reduce the water, soil and crop impact;
- To encourage behavioral change of end-users toward the use of non-conventional water agriculture.

WHO IS BENEFITING?

- 160 farmers thanks to increased available water and water quality
- 15 local organizations involved in water management (municipalities, local authorities, public agencies)
- Local communities
- National and regional policy-makers who are gaining relevant data and good practices on innovative solutions for water supply

ACHIEVEMENTS

- One database on the water supply, water quality, soil composition and crops situation in the 4 target areas.
- Four innovative solutions for NCW supply implemented for different irrigation and domestic purposes.
- 1451.4 hectares of land irrigated with treated wastewater.
- Four handover agreements with beneficiaries, local authorities and water agencies to ensure the management of plants after the end of MEDISS project.
- Four cross-border thematic practitioners and research networks on NCW supply for agricultural and domestic purposes.
- Four local governance plans that integrate MEDISS NCW supply solutions.

CAPITALIZATION PLAN

The Capitalization Plan is a strategic document, developed during the 2nd and 3rd year of the project to promote the transferability and exploitation of the MEDISS experience in other projects or initiatives after project's completion. The Plan guides MEDISS partners on identifying synergies, optimizing the impact of MEDISS project and involving final beneficiaries and stakeholders in activities.

In brief, the capitalisation & dissemination process is an activity in which project partners and beneficiaries are involved in a common process of valorisation and dissemination of experiences, which aims to:

- Identify good practices emerging from the projects
- Encourage exchange between projects
- Integrate good practices in the development strategies of the territories

- Make the knowledge assets generated by the project more accessible, thus improving the transfer of knowledge;
- Promote the re-use and transfer of these knowledge assets;
- Use the pilot experiences results to develop a project at industrial level;
- Use the knowledge gained in the projects for the planning phase of future cooperation programs and upscaling of pilot projects;

In order to achieve these results, it is necessary to define the strategic framework for the Capitalization Plan: the main purpose is **widening knowledge, use and transfer of MEDISS knowledge assets, outputs and experiences to enable the use and take up of the results.**

MEDISS partners will have to pay particular attention to two guidelines:

- the need to target the categories of users who may be potentially interested in project results and the capitalisation phase;
- it will no longer be sufficient to have a generalist communication, but it is essential to specialise the communication in order to valorise results and outputs also outside the MEDISS context.

The Plan pays particular attention to the sustainability of the results and the enhancement of their impacts on regional level through direct involvement of local and regional policy makers, stakeholders and enterprises.

Objectives

The dissemination & capitalisation strategy is envisaged to be a support process for streamlining MEDISS impacts to potential beneficiaries by:

- Wide-spreading dissemination: creating awareness and attracting interest and involvement of a vast range of stakeholders
- Transferring results to upgrade innovation systems and practices: Therefore, the outcomes will allow the enhancing of water efficiency policies and systems on regional and local level.
- Sustainable use of results: the results are taken and creatively used by target groups and all the potential stakeholders.

The project communication provides the backbone for effective and efficient dissemination of knowledge assets: MEDISS dissemination & capitalization strategy is put in practice through the communication activities and the design of specific tools as an output library, specific publications and thematic events (during the four final project conferences - 1 per area). The tools will be adapted according to the needs of the partners and the evolution of the project. This logic will ensure ongoing capitalisation of results at MED and regional levels support the exchange of experiences and good practices.

Targeting

MEDISS project communication and capitalization will extend from the environmental expert to the public. The targeting of MEDISS beneficiaries, done at the beginning of the project, highlighted the segments presented in the table below.

During the project, the different target segments were involved in the activities of the Awareness Programme, capacity building and dissemination of the results/knowhow of MEDISS.

GROUP	OBJECTIVE	FROM PALESTINE	FROM ITALY	FROM JORDAN	FROM TUNISIA
Local communities: Farmers. They share the need of safe, less saline and less expensive water to irrigate farms	To inform local communities about the project activities, the project objective and about its implications	Members of the Palm Farmers' Cooperative Association (PFCA)	Farmers of Arborea district of irrigation	Associated farmers and citizens of the village of Al Risha	Farmers in pilot station of Dissa, Gabes
Local organizations: public/private actors which share the need of innovative solutions for water supply to prevent water crisis and to lower water costs for end-users	To inform local communities about the project activities and the project objective. To share with local organization the actions done and to involve them to participate at the project with their knowledge	Municipality of Jericho, GoJ	Municipality of Arborea, ENAS, Sardinia Regional Authority, CRENoS	AWC, Al Risha Municipality	Gabes Regional Agricultural Development Commissariat, Ministry of Local Affairs and Environment, University of Gabes, IRA
Other members of local communities and general public	To ensure their involvement in the disseminative activities proposed and to ensure their acceptance	palm date farmers in Jericho area South East and North East of Jericho (about 14 small-medium farms)	250 farmers Primary and secondary schools. High Schools of Agriculture, Universities	5229 people living in the Araba Valley	other farmers (30) in Gabes Governorate
Institutions who will gain relevant data and good practices on innovative solutions for water supply	To ensure their involvement in the disseminative activities proposed and to ensure their acceptance	Palestinian Water Authority, National Ministry for Environment and Agriculture	Sardinia Regional Authority, National Ministry for Environment and Agriculture, DG Environment, Provincia di	Ministry for Environment and Agriculture	Ministry for Environment and Agriculture

			Oristano, Oristano Municipality, Sardinian Regional Agencies for Agriculture Development		
Other relevant projects and relevant stakeholders	Widening knowledge, use and transfer of MEDISS knowledge assets, outputs and experiences to enable the use and take up of the results	ENICBCMed Projects of B.4.1 priority “Water efficiency”, MedSea Foundation, Spirulina Project by Tolo green, Laore Sardegna “Re-live waste”, Jordanian Hashemite Fund for Human Development (JOHUD) Horizon Program projects PRIMA projects			

In order to refine the targeting, each partner has identified, because of its own upscaling strategy and capitalization profile, further segmentations.

Below is a first list of new targets:

- Managing Authorities of European Regional and National Operational Programmes (in particular those funded by the European Regional Development Fund) and National Programmes (e.g. Fund for Development and Cohesion in Italy) in order to foster upscaling strategies and their potential funding:
 - o INTERREG NEXT MED 2021-2027
 - o Initiative WEST MED
 - o NEXT Italia Tunisia
 - o EFRD Sardinia 2021-2027

Capitalizing helps to enhance the know-how and good practices developed and benchmarks, contributing not only to the reasoned promotion of quality projects for possible reuse, but also helping to establish quality standards for the selection of future projects related to water management and environmental sustainability;

- Communication and capitalization experts of EU-funded co-operation projects who play an essential role as Communities of Practice supporting knowledge transfer, from which opportunities for creation/integration in new project networks may arise;
- Regional and national decision-makers for territorial development policies - with whom to activate strategies for the mainstreaming of MEDISS results on different territories and for the development of new projects;
- Experts in the field, at national and European level - who can help disseminate the results of MEDISS in specific areas and can become promoters of viable project parks on the basis of these results;

- Citizens and their representatives - who have a right and need to know how the added value of the economic resources that MEDISS has mobilized to improve the competitiveness of the area and reduce the environmental impact of agricultural production, can be increased.

What to capitalise on

Highlighting the best results that have emerged during implementation at both country and transnational level based on three main criteria: relevance, sustainability and transferability. Knowledge of the results will help partners in mainstreaming and capitalisation activities.

Partnership & Networks: the MEDISS Legacy

MEDISS is closing amid a social & economic landscape that is dramatically different from the one that existed when the initiative kicked off (COVID19, the focus on transitions (ecology & energy), the boost of climate change, and the war in Europe) MEDISS partnership faced important challenges.

The results of this challenge represent important resources that deserve to be mainstreamed and capitalised on: the MEDISS Legacy:

- Result Oriented Management (ROM)
- Resilience & problem solving
- Communication attitude and approach
- A strong partnership (not just partners but people who share values, knowledge who know how to work together and how to learn together)
- Strong strategic alliances in an international dimension (Cooperation Project, Research Centres & Universities, Agrifood Companies, Innovative Start-ups, Local Authorities, European Regions, Governmental Organizations)
- Beneficiaries who could see the positive results of our collaboration
- Sound know-how

MEDISS partners have to mainstream projects results in public policy planning and in the implementation of the 2021-2027 Programmes financed by other EU development and cohesion resources. The pilot experiences made can be transformed into models, plans, standard procedures, applicable in a wider and/or more general context.

As suggested by the Interim Evaluation Report, it is highly recommended to create a data base about the available opportunities of funds and partnerships horizons, opportunity of synergies, and their requirements as a tool that will facilitate following up and outreach.

At the time of preparing this draft, the scenario points to the INTERREG NEXT MED Programme as the best opportunity, in particular for the territorial context involved and the areas of intervention envisaged.

Evidence of ability to contribute to local development

MEDISS benefits by having already started dissemination and capitalisation activities as well as scaling up of pilot projects. This can help to strengthen connections with ongoing development processes and projects in the pilot areas. The leaders and stakeholder of these projects were all involved in the MEDISS activities in order to facilitate their integration with ongoing projects and sustainability. Some example:

In Italy, many local development initiatives are concentrated in the Arborea area. The large number of development projects is motivated both by the centrality of the area, which represents an agricultural and agri-food cluster of primary importance at both regional and national level in which leading companies in the business sector operate; and by the relevance of environmental issues and the fight against climate change inherent to the presence of wetlands and the presence of the reclamation area.

- the Territorial Development Project (Dal mare verso l'interno: gli itinerari del Terralbese e del Linas) financed by the Autonomous Region of Sardinia, also with the contribution of the European Union, focused on the themes of safeguarding, valorising and promoting territorial resources in a sustainable perspective.
- The Maristanis project, an international cooperation project that aims at defining an integrated management model for the coastal wetlands of the Gulf of Oristano; cofunded by the MAVA Foundation and coordinated by the MEDSEA Foundation in collaboration with the Marine Protected Area "Sinis Peninsula - Mal di Ventre island". MARISTANIS is working in parallel with three other projects cofunded by MAVA in Tunisia, Montenegro and Albania.

In Tunisia, from the very beginning, MEDISS worked with the local Agricultural Development Group of Wadi Chirka (Elhamma Gabès). The agricultural development strategy in Tunisia has encouraged the creation of Agricultural Development Groups (ADG) with the aim of integrating rural actors into the local economy. Through the GDA, farmers are involved in local development. The groups are in charge of protecting, rationalising and safeguarding natural resources and equipping the areas. They take over the activities of the administration (supervision of members; dissemination of techniques to improve productivity; improvement of livestock and grazing systems; assistance in resolving agrarian conflicts). They also ensure cooperation and exchange with national and international agricultural organisations in the field of agriculture and fisheries.

In Palestine, MEDISS shared the project with the association of date producers PFCA – Palm Farmers Cooperative Association, with whom the MEDISS partners have a long and solid experience of collaboration. The Jericho Area and the PFCA cooperative are involved in many development projects financed by international donors (including the Italian and Japanese development cooperation agencies). Among the most relevant are the one carried out by the AICS Italian Agency for Development Cooperation, the Association of Cooperatives Confcooperative and the municipality of Bergamo. The overall objective of this 36-month collaboration (until December 2024), is to contribute to the strengthening of the territorial institutional system for the promotion of economic inclusion and the enhancement of the territory of Jericho governorate and specifically, to improve the system of local territorial governance and s

In Jordan, the link between MEDISS and the development processes in the Al Risha area were considerably strengthened due to events that occurred during project implementation, which led to the depletion of water resources for drinking water. Since the maintenance of this water source will take long and non-estimated time, Aqaba Water Company immediately started the pumping of the entire desalinated water quantity (22 m³/ hour) to the 2600 residents of the area saving their daily needs of domestic and drinking water. Thanks to MEDISS, the population of Al Risha is not forced to relocate.

Strategic approach consistent with policies for sustainability, green transition and the fight against climate change
As underlined in the MED Diagnosis Report 21-271 during the 2014-2020 programming period, international reports and analysis have highlighted the central challenge of climate change and its effects on the environment and human activities for the years to come. This issue is especially crucial in the Mediterranean area with temperatures increasing faster than the EU average and with a cumulation of environmental risks.

In this context, international & national policies request to develop resilience to face the changes underway and develop approaches able to consider the environmental dimension of sectoral activities (agriculture, tourism, transports, fisheries etc.). These issues have also strong territorial dimensions with area presenting specific threats and potentials (dry lands, coastal areas, islands, mountains...).

¹ Building on EU strategic orientations, the diagnosis report identifies opportunities for future EU Mediterranean transnational cooperation including governance perspectives based on the EC orientation paper.

All the EU policy documents in the Mediterranean context, it is important to mention also the question of water and waste management and sea pollution which have strong effects on ecosystems and biodiversity (and reversely on human activities). In the Mediterranean region, valuable resources are depleted, with water scarcity majorly exacerbated by increasing climate variability, urban sprawl, mass tourism and pollution levels continuing to be on the rise.

European Cooperation Policy Objective – MED Area aims to contribute to the transition towards a climate-neutral and resilient society. It aims at fighting the impact of the global changes on the Mediterranean resources while ensuring a sustainable growth and the well-being of its citizens. It is fully aligned with the UN sustainable goals, the 2030 Agenda for sustainable development and the European Green Deal. Forthcoming cooperation projects will have at their core to make the Mediterranean smarter and greener. They will operate to fulfil four complementary missions to fight the impact of global changes.

Mission 1 : Strengthen an innovative sustainable economy. This can be done more specifically by consolidating a competitive innovation ecosystem with the stakeholders of the 4helix² or by supporting the transition to a circular economy

Mission 2 : Protect, restore and valorise the natural environment and heritage

Mission 3 : Promote green living areas

Mission 4 : Enhancing sustainable tourism. This mission will concern all projects that fit into the 3 above mentioned missions.

Complementary priority: providing the Mediterranean with better territorial governance.

Country	Results to be capitalised
All	<p>The MEDISS Legacy</p> <p>MEDISS results, being the fruit of a virtuous process of collaboration between partners of different nature and origin, have characteristics of innovativeness and duplication that are not always found in projects financed on a regional or national scale</p>
Italy	<p>The pilot plant built in Arborea (Sardinia) meets the two objectives of</p> <ul style="list-style-type: none"> - Reducing the impact of ammonia in water and on the soil, creating repeatable best practice in nitrate-vulnerable areas; - Producing low-impact fertilizer for agriculture. <p>The next goal is to create an industrial-scale plant given the large amount of raw material available in the Cooperative Produttori Arborea for treatment and the opportunity to have numerous farmers and breeders in need of fertilizer.</p>
Palestine	In Jericho, best results are summarized in:

² The EU Quadruple Helix-based model of innovation involves representatives from all members of society; public authorities, industry, academia and citizens. Public authorities include government and regional development agencies and policy makers, as well as formal health care providers in some countries (as in Sweden and Norway).

- Reducing stress on ground water by blending the surface lost wadi water with treated wastewater;
- Take advantage of the surplus treated wastewater during winter by collecting it in the mixing pond;
- Improving the quality of irrigation water by reducing salinity specially during summer season when artesian wells become more saline

Tunisia IRA focused first studies on the analyses of soils irrigated by treated wastewater for different periods (1; 7 and 15 years) and this for the summer and winter period to better understand the behaviour and evolution of the soil structure. These results are the subject for the tracing of a future strategy for the irrigated perimeter.

The second study concerns the improvement of the physic-chemical and bacteriological quality of wastewater treated by the installation of an experimental process of percolation infiltration. A follow-up of the various parameters is carried out and the results obtained will be the object of the optimization of the purification efficiency of the system for a possibility of enlarging this type of treatment.

Jordan The pilot plan succeeded in raising the quality of drinking water that serves the region in Wadi Araba (Al Risha) by reducing salinity, creating also the condition to work on the reuse of brackish water for agricultural purposes.

Capitalization principles

In order to provide clarity and improve the quality of the documentation, all capitalization activities should follow the following principles:

- Respect the intellectual property rights of all partners;
- Recognising and respecting the work of all partners by ensuring the correct reference of all relevant parties whose work is directly or indirectly mentioned in the publication;
- Coordinate actions to avoid overlapping or duplication of dissemination activities;
- Establishing clear criteria to distinguish between results suitable for dissemination and results that can be exploited;
- Addressing appropriate audiences;
- Each beneficiary must - as soon as possible - disseminate information on the benefits obtained and, in the case of transfer of pilot plants, inform the public by appropriate means;
- Any dissemination of results must state that it reflects the views only of the author, and that the EU is not responsible for any use that may be made of the information contained therein;
- **Respect the rule on "Information on European Union funding - Obligation and right to use the EU emblem", all dissemination material should mention the name of the MEDISS project, the ENI CBC MED Programme, its financial support to the project and the EU emblem;**
- Where appropriate, the visual identity of the project should be included.

Capitalization activities results

The results to be achieved are:

- To produce thematic and territorial policy recommendations and strategic project orientations
- To share knowledge and to make results known, transferred and used as widely as possible in the Mediterranean area, harmonising and improving the quality of regional and local policies
- Increased dissemination of good practices on water efficiency and the fight against climate change.
- Improvement of compliance with legislation and environmental policy.
- To create synergies among the projects and coordination with other programmes and funds
- Creation and/or reinforcement of collaborative processes and networks (including key actors, regional bodies and companies)
- To extend the benefits of project actions to a wider population and geographical area coverage;
- Design and elaboration of new innovative projects;
- Strengthening of the technical capacities of the offices responsible for water resource governance.

CAPITALIZATION ACTIONS

MEDISS capitalisation networks

The 'network' is a support system - a community - that sets the framework for a cooperation process and involves representatives of MEDISS target groups and/or other stakeholders.

MEDISS has fostered the creation of a strong network of partners and local partnerships over the three years. This complex network can be used as a resource to acquire new contacts, knowledge and expertise, provide opportunities for new projects or be a support framework to refer to for technical assistance or mentoring for its Members. They can serve both to learn and to promote/share knowledge, information and results.

MEDISS Capitalization Networks will focus on the following topics and cross-cutting themes: Sustainable development / Climate change and Risks Network / Circular Economy.

MEDISS partners may establish **partnership agreements** with organisations, institutions, companies or local authorities with which they share an approach for sustainable development and the fight against climate change or to develop support tools for development processes.

Building bridges with relevant projects

Linking MEDISS to other cooperation projects is a clear capitalization opportunity. All partners are working for the sustainable growth of their regions. In this sense, it is important to search for projects sharing the same purposes and aims in order to undertake actions together even after the project's conclusion.

MEDISS is part of a wider pool of projects elaborated in the ENI CBC area that deal with the water efficiency. In order to speed up spill-over effects on regional level across all partner countries the project partners shall identify relevant projects so as to ensure that future events of these projects shall capitalize on the knowledge accumulated and classified under MEDISS and will also inform their own networks of contacts respectively.

Capitalization for upscaling strategy

The results of cooperation projects financed by the European Union have been obtained using public resources and, since they are the result of a virtuous process of exchange and cooperation between partners of different natures and countries, they have innovative and replicable features that are not always found in projects financed on a regional or national scale.

An essential stage of the capitalisation process is to support and stimulate, in a focused way, the transfer and reuse of what has been achieved. The aim is not an informative activity, but an operation aimed in practice at intercepting the categories of subjects that are most likely to be interested in what has been produced so far by MEDISS projects and that, because of their respective competences and fields of activity, can:

- replicate, with the necessary adaptations, what has been achieved by MEDISS in another territorial area;
- transfer the know-how acquired, often through pilot experiments, to a larger scale or at a more general level;
- re-using the outputs produced and integrating them, updating them, increasing their effectiveness, producing additional results.

Country	Strategic guidelines up-scaling strategy
Italy	<p>In addition to the carrying out of the feasibility project on an industrial scale of the ammonia stripping plant for the Cooperative Produttori Arborea, the Spirulina Company, part of the international Tolo Green Group, which took part in the trial of the fertiliser produced by the MEDISS pilot plant, expressed interest in using the positive results of the trial and internalising them in their production processes. Other contacts were established with the Swiss plant STEPyVerdon which Enas visited with the Cooperativa Arborea to better define a future feasibility project for an industrial scale plant. In addition, contacts are being made to start an action to raise awareness on other agricultural and pastoral realities (in nitrate vulnerable area) on the functionality of the system.</p> <p>The MEDISS Italian Partners are planning to study the development of a tool for analyzing the performance of forecasted scenarios with a variety of environmental, social, economic indicators that reflect the characteristics of these scenario regarding Innovative Water Solutions. The tool could be named after MEDISS, (e.g. MEDISS Performance Tool) data processing could be carried out using this tool which could be a web tool based on open sources software's to lower costs and create user friendly environment, giving clear justifications for some proposals based on their calculated scenario, helping in transferability, replicability, scaling-up, synergies, optimizing MEDISS impact and promotion of its approach</p> <p>Based on MEDISS' experience, ENAS developed cooperation projects focused on sustainable development, based on the principles of good governance, community participation, ecological sustainability and social inclusion, as set out in the Agenda 2030 objectives (objectives 6 and 13). These objectives will be achieved through the capacity building of local administrators, the provision of tools for planning, management and monitoring of basic water services; the increase of clean water sources for the</p>

	<p>populations; the involvement of local communities in the management of natural resources (water and forests); the promotion of actions related to the circular economy (awareness raising sessions, construction and supply of biodigesters, carbon sink to offset CO2 emissions produced by the project activities. Finally, the dissemination of the values of coexistence in solidarity.</p>
Palestine	<p>Governorate of Jericho along with PFCA and Irrigation Water Users Association are planning to share this pilot experience of blending water with all farmers unions not only in dates sector. In addition, there will be the sharing of the results from water and soil analysis before and after irrigation with blending water with Ministry of Agriculture and Palestinian Water Authority to work on replicate MEDISS pilot in all areas with same conditions.</p> <p>More and more, PFCA after meeting with Governorate of Jericho expressed their intention to increase the blending area capacity by increasing the catchment area of the lost surface wadi area; this in turn will increase the amount of irrigation water especially during summer season.</p> <p>In addition, Palestinian Wastewater Engineers Group is developing a project that The project will contribute to the development of new public policies and policy-relevant innovations. Its effects will be long-lasting and far-reaching, fostering significant change through the achievement of sustainable, tangible and replicable results that last beyond the end of the Programme financial support, and the transferability of good practices. In terms of participation, it will bring together key public and private actors at all levels (national, regional and local) with extensive experience and competencies to foster impact, change and policy innovation.</p>
Tunisia	<p>The results on the soil sampling campaigns will be published in an information day for farmers and stakeholders.</p> <p>The optimization of the tertiary treatment of treated wastewater will lead to the choice of the most reliable filtering mass for the treatment; this one will be chosen for the possibility of expanding the pilot station.</p>
Jordan	<p>Aqaba Water Company is evaluating the opportunity of transferring knowledge to other Wadi Araba regions that suffer from the same problems, as the drinking water has some salinity. Therefore, AWC, in coherence with the National Water Strategy 2016 – 2025 that emphasizes desalination to meet shortfalls in freshwater availability and wastewater reuse.is evaluating of improving and up scaling the existing desalination plants and to establish new ones.</p> <p>In addition, AWC is evaluating the opportunity of a Mobile Desalination plant: a facility on truck with a capacity of 100 m³/hr. This project will include complete Sea Water Desalination plant to treat the Sea water from the Red Sea to provide the local community with drinking water. All the desalination components are pre-assembled in 1 to 2 containers, including the piping and control systems, which considerably reduces the on-site installation workload and time required for effective fresh water production.</p> <p>The Project Objectives are clear: in case of emergency this project will provide the community with drinking water, and this produced water will be another source for human use in the case of water shortage. The benefits of this facility are:</p>

Minimal site preparation required for Mobile Water Treatment Plants including civil works, electrical trenching, pipe trenching concrete slabs etc are mostly avoided

No expensive purpose built building required

No expensive onsite installation

Systems are often prebuilt allowing faster delivery

Equipment is mobile and can be moved from site to site

Infrastructure of lighting, safety showers, electrical distribution, emergency lighting, climate control are all inclusive with the container and do not require separate building services

Capitalisation and valorisation of scientific research

Researchers - research grants

Each partner, particularly the scientific ones (CRENoS and IRA of Medenine), have to identify potential opportunities to capitalise and enhance the knowledge developed by MEDISS through:

- the activation of researcher positions either through research grants activated with their own resources or by exploiting research programmes financed by national or international institutions;
- the embedding of the MEDISS case study in academic lectures, also by involving experts from the project partners in the teaching activities;
- the organisation of study visits of students, experts and researchers operating in the partner organisations.

The University of Cagliari-CRENoS has already activated a researcher position (financed by Italian Ministry of Research) to develop, over the next three years, a research project³ that, in addition to capitalising and disseminating the MEDISS results in the pilot area of Arborea (Italy), will allow the development of further know-how, also in order to define new projects for the territory and for the MEDISS partnership.

Papers and articles for scientific/professional meetings, congresses, and journals

MEDISS partners, particularly the scientific ones (CRENoS and IRA of Medenine), are invited to create a set of case studies on water efficiency in order to show off the best practices implemented. All members of the project using the case studies of pilot experiences might update the database.

MEDISS partners produce scientific papers, articles and posters both for use at events and conferences and for publication in national and international journals dealing with local development, water efficiency, etc.

Already available for capitalisation are

- The scientific posters in English of the overall MEDISS Project and the pilot projects in Italy and Tunisia;
- The case study on the pilot experience in Arborea (IT) in Italian language: Cordeddu, M. Pireddu, A. (2021) "Sardinia and international cooperation for a new hydraulic culture" published in the *29th Report on the Economy of Sardinia* (CRENoS).
- The case study on the Arborea area (IT) in Italian Language: Perelli, C. Sistu, G. (2022) "Vulnerabili. La bonifica, I suoi abitanti e il rischio nitrati" *Geotema*

³ In particular, the research analyses NVZs, Nitrate Vulnerable Zones of Agricultural Origin, (Directive 91/676/EC), in which intensive agricultural activities, the use of nitrogenous fertilisers, or nitrate-rich animal effluents, have led to a deterioration of water quality parameters. In continuity with the ENI CBC MED MEDISS Project, implemented in the ZVN area of Arborea (IT), the research intends to contribute, with the support of the Cooperativa Produttori Arborea, to:

- Strengthen the circular economy model generated by the stripping of ammonia in biogas and the production of ammonium sulphate;
- Support the process of changing the agronomic model in the Arborea NVZ for the reducing the environmental impacts of fertilisation activities;
- Involve agricultural operators and other territorial actors in order to make structural interventions of mitigation of impacts on soils and groundwater;
- Develop a methodological proposal to reduce the impact of improper agronomic practices in other NVZs.

- The scientific article on the pilot experience in Tunisia: Rim Werheni Ammeriab, Yassine Hidric, Faiza Souida, Giuseppe Di Rauso Simeone, Feryell Hajjajia, Mohamed Moussaa, Abdennaceur Hassenb, Saifeddine Eturkia (2023) "Improvement of degraded agricultural soil in an arid zone following short-and long-term treated municipal wastewater application: A case study of Gabes perimeter, Tunisia' published in *Applied Soil Ecology* 182 (2023) 104685.

Conclusions

Excellent results have been achieved by the pilot plant in Arborea set up for the stripping of Ammonia Nitrogen from the digested livestock waste.

The results demonstrate that the adopted stripping technology is effective for the recovery of ammonia from zootechnical digestate and therefore is suitable to optimize the management of the digestate in a NVZ such as Arborea plain, contributing to reduce the nitrogen load on the soil.

In particular the main results are the following:

- 1) up to 90% of N-NH₄ removal efficiency has been reached on the pilot plant. Considering that about 42% of the nitrogen content in the digestate is in ammoniacal form, 54% total Nitrogen content reduction in the digested livestock waste has been obtained;
- 2) The N-NH₄ removed fraction has been recovered as ammonium Sulphate fertilizer that has been stocked and reused in controlled way. In the course of the experimental study about 40 Kg NH₄, stocked in 2'000 liter of ammonium sulphate solution of 8% in (NH₄)₂SO₄ (20'000 mgNH₄/L) has been recovered;
- 3) IMPROVEMENT: A) a more efficient pretreatment to optimize the pH adjustment and the suspended solid content- B) a specific membrane module to concentrate the fertilizer.

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Fabrizio Cassi
Michele D'Amico
Monica Dreon
Carlo Ponzio

Mediss PP1 - ENAS

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Stefano Serra
Roberto Meloni
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CPA
Valter Mureddu (President of CPA)
Marco Peterle (General Director of CPA)
Lino Tammaro consultant agronomist of CPA
Roberto Schiavon agronomist of CPA

Comune di Arborea
Manuela Pintus, Sindaca di Arborea
LAORE (baseline data and soil campaign and analysis support)
Francesca Fantola pedologist
Andrea Palomba agronomist
Giandomenico Zucca agronomist
Andrea Manca agronomist
ARPAS (baseline data support)
Maurizio Testa (Geologist)
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Brenda Tuosto
Marcel Purro
Sandro Rosselet
Antoine Sauser

Mediss PP2 - CRENoS:

Giovanni Sistu
Aide Esu
Carlo Perelli
Anna Pireddu
Michela Cordeddu
Filippo Petrucci
Laura Stara

Mediss PP3 - Aqaba Water Company:

Nizar Akkawi
Ameer Al Madahin
Ahmad Al Hanaqtah
Anas Al Khateeb
Sadam Abu Nawas

Beneficiaires

Qaa Al-Saeedeen Agricultural Association

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Saifeddine Eturki
Yessine Hidri
Faiza Souid
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