Contract no. **688320**

MADFORWATER
DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries

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Contents

1 Abstract

Deliverable 7.3 reports the activities already carried out and planned for the dissemination of the MADFORWATER project results: the communication channels and tools that have been adopted and will be adopted to disseminate the MADFORWATER project objectives and future results and the strategy to reach the different stakeholders. The aim of the dissemination and communication activities is to widespread the project objectives and potential benefits towards the stakeholders to generate awareness without compromising IPR; to obtain feedback and suggestions about the intermediate project results to get a comprehensive validation from stakeholders covering all the targeted market sectors; to raise public consensus on the environmental, social and economic benefit of the proposed solution.

2 Introduction

Deliverable 7.3 reports the activities already carried out and planned for the dissemination of the MADFORWATER project results. The document includes a description of the communication channels and tools that have been adopted and will be adopted to disseminate the MADFORWATER project objectives and future results as well as a description of the strategy to reach the different stakeholders, at appropriate times and with an appropriate methodology.
This plan is also to be considered as a guide to support the consortium to carry out the dissemination activities using the right material and channels.
D7.3 is an update of the deliverable D7.2 "Dissemination and communication plan" (realised at Month 6 of the project) and will be updated at month 36 (D7.4) based on the project's evolution and of the acquired new knowledge that will allow adding new dissemination opportunities. The document also describes the communication materials realised (which will be further documented in the Deliverable 7.7 - "Final report on the dissemination activities and materials" at month 48).

The document is articulated in 4 main sections (excluding the introduction section):
Section 3 MADFORWATER Project presentation
introduces the main objectives and benefits of the MADFORWATER project.
Section 4 MADFORWATER approach to Dissemination
relates to the MADFORWATER strategy to its dissemination activities.
Section 5 Dissemination activities, materials and tools
reports the dissemination materials realised and the ones planned, the channels used for the dissemination, and the activities carried out and planned by each consortium partner including conferences, press release, presentations and papers.
Section 6 Dissemination activities tailored for the various categories of stakeholders
describes the dissemination activities tailored for each category of stakeholder.

3 MADFORWATER Project presentation

This section briefly recaps the general goals and the expected benefits of the MADFORWATER project.

The Project
MADFORWATER is a research and innovation project funded by the European Union's Horizon 2020 programme and coordinated by the University of Bologna. Its full title is "DevelopMent AnD application of integrated technological and management solutions FOR waste water WATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries". The consortium consists of 18 partners geographically distributed mainly around the

Mediterranean: 12 partners from European countries, 5 from North Africa and 1 from China. It comprises 9 universities, 4 research centres, 4 SMEs and 1 international non-profit organization.

Objectives and benefits

The objective of MADFORWATER is to develop an integrated set of technological and management instruments for the enhancement of wastewater treatment, treated wastewater reuse for irrigation and water efficiency in agriculture, with the final aim to reduce water vulnerability in selected basins in Egypt, Morocco and Tunisia. In terms of approach, MADFORWATER develops and adapts to three main hydrological basins in the target countries technologies for the production of irrigation-quality water from drainage canals, municipal, agro-industrial and industrial wastewaters, and technologies for water efficiency and reuse in agriculture, initially validated at laboratory scale. Selected technologies are further adapted and validated in four field pilot plants of integrated wastewater treatment and reuse. Integrated strategies for wastewater treatment and reuse targeted to the selected basins are developed, considering climate change, population increase and economic growth scenarios. The project also develops innovative tools for the identification and quantification of water vulnerabilities in the target countries.
MADFORWATER is expected to lead in the selected basins to a significant increase in wastewater treatment and treated wastewater reuse, and to an overall decrease in water stress.

4 MADFORWATER approach to Dissemination

Aim of the dissemination and communication activities is:

- To widespread the project objectives and potential benefits towards the stakeholders to generate awareness without compromising IPR;
- To obtain feedback and suggestions about the intermediate project results to get a comprehensive validation from stakeholders covering all the targeted market sectors;
- To raise public consensus on the environmental, social and economic benefit of the proposed solution.

The general dissemination approach to promote the widespread adoption of MADFORWATER initiatives includes:

- Design of the MADFORWATER brand (logo, colour, pictures etc);
- Realisation of promotional materials such as: website, brochures, template for project documents, power point presentations, newsletters, etc.;
- Launch of a media campaign by articles in magazines, press releases, social networks, newsletters etc;
- Participation in major events such as exhibitions, conferences, workshops, specialised international meetings, etc.;
- Establishment of synergies with other projects and initiative;
- Establishment of synergies with the results of the stakeholders' analysis (D7.1) to shape dissemination activities for each stakeholder.

The dissemination strategy foresees to actively involve all MADFORWATER partners. The partner responsible for dissemination (PNO) coordinates the communication of the project results and designs and realises the relevant dissemination materials.
All consortium partners have a key role in the diffusion of project results and all the partners are committed to present project outcomes and are requested to maintain an active participation within the dissemination strategy. Proactive and balanced levels of participation will have

profound effects throughout the whole project, and will guarantee that the dissemination techniques are applied to the widest possible extent.
Dissemination Tables are regularly (each 6 months) distributed to each partner to collect and monitor the dissemination activities carried out during the project or foreseen by each partner. ANNEX 2: LIST OF DISSEMINATION ACTIVITIES reports the table collected up to present for each partner.
Events of interest for the projects are regularly posted on the MADFORWATER website in the page "News and Events", to promote an active participation of project partners and interested stakeholders.

5 Dissemination activities, materials and tools

Several dissemination materials and tools have been produced and other will be produced through the entire course of the project. The dissemination materials will be realised according to different communication needs, to various event typologies and to follow the project evolution and results.
The dissemination materials and tools realised and the activities carried out up to month 6 have been already described in D7.6 "First report on the dissemination activities and materials". The final deliverable D7.7 "Final report on the dissemination activities and materials" at month 48 will include the analysis of the dissemination activities as well as the actual dissemination materials.

5.1 Dissemination materials and tools produced during months 1-18

In the following, we briefly report all the dissemination materials produced up to month 18:

- **MADFORWATER Logo**: a graphical logo has been selected among several ideas realised with the main intentions to remember the name of the project and the main project goal (water efficiency in agriculture). The logo is present on all the dissemination materials (website, brochure, presentation template etc.).
- **Presentation template**: MADFORWATER project template for presentations has been realised in pptx format with main intention to recall the project logo and visual identity. The template is available for all partners in the private area of the website.
- **MADFORWATER introductory presentation**: It is a pdf including a general introduction on the goal, concept, objectives, results and other aspects of MADFORWATER. It is a public document, available for download on the project website, in the section "Public documents" (http://www.madforwater.eu/wp-content/uploads/2016/10/Madforwater-introductory-presentation-.pdf). See ANNEX 5: MADFORWATER introductory presentation.
- **Project website**: a dedicated project website has been created at the beginning of the project (on line at M3) and will be maintained active for at least 3 years after the end of the project (http://www.madforwater.eu). The main pages of the public section are available also in French and Arabic. Stakeholders have the possibility to register on the MADFORWATER website to receive updates about project results and the newsletter in their email boxes. A screenshot of the website is shown in Figure 4.
- **Brochure**: the brochure presents the MADFORWATER objectives and benefits and includes a contact section and the logos of the partners involved in the project. It is a public document, available for download on the project website, in the section "Public documents" (http://www.madforwater.eu/wp-content/uploads/2017/06/MADFORWATER-leaflet.pdf). See ANNEX 3: MADFORWATER brochure. 915 brochures have been distributed until now during conferences, workshops and other events attended by partners.
- **Poster template**: it is realised in pptx format for easily editing by partners. The general structure of the poster is fixed and partners can edit only two sections (namely "Title 2", "Title

3") to insert the methodology used and the results obtained to be shown at conferences/events. The template includes the project title, a brief description of the MADFORWATER objectives, the logos of the partners involved in the project and the acknowledgements. The poster template is reported in ANNEX 4: MADFORWATER poster template.

- **Video**: A 7 min project video is available with subtitles, directly on the homepage of the website (http://www.madforwater.eu/) and it was also launched in PNO Innovation Place/ R&I newsletter (December 2016 issue). The video presents the MADFORWATER objectives and the consortium and it is intended to reach the general audience.
- **Newsletters**: The first project newsletter has been released in May 2017 and is available in three languages: English, French and Arabic. The newsletter includes:
  - an update on the MADFORWATER activities;
  - a list of the conferences where MADFORWATER has been or will be presented;
  - a description of the consortium.

  The newsletter is a public document and can be downloaded on the project website, in the section "Public documents" (http://www.madforwater.eu/wp-content/uploads/2017/06/MADFORWATER-Newsletter-May2017.pdf; http://www.madforwater.eu/wp-content/uploads/2016/07/MADFORWATER-Newsletter-May2017-FR.pdf; http://www.madforwater.eu/wp-content/uploads/2016/07/MADFORWATER-Newsletter-May2017-ARABIC.pdf). See ANNEX 6: MADFORWATER Newsletter. Emails have been sent to **472 stakeholders** previously identified to inform them about the newsletter availability. The email sent is reported in ANNEX 7: Email to stakeholders: MADFORWATER newsletter available in English, French and Arabic!

  News on social media have been published to disseminate the newsletter availability (see ANNEX 2: LIST OF DISSEMINATION ACTIVITIES).
- **Social media channels**: to increase the online engagement with stakeholders, MADFORWATER accounts have been created on the world's most famous social networks (i.e. LinkedIn and Facebook). Screenshots of posts/news announcing the project progresses, updates, relevant participation to the main events and published on these social media are presented in Figure 5 and Figure 6.

Behind the dissemination channels produced for the MADFORWATER project itself, several other channels have been used to increase project visibility and to spread MADFORWATER results:

- **Partners' social media**: Posts have been also published on partners' social media, such as partners' twitter accounts, LinkedIn etc (see Figure 5 and Figure 6). Starting from October 2017, the sentence "Our project #MADFORWATER was made possible thanks to #H2020 #InvestEUresearch!" was added to the tweets to allow the EC communication team to track the tweets and retweet them on the @EU_H2020 Twitter account, as suggested by the project Adviser Dr. Giulio Pattanaro.
- **Partners' platforms**: two PNO proprietary platforms, "Innovation Place" (https://www.innovationplace.eu/) and "Ricerca & Innovazione" (https://www.ricercaeinnovazione.it/) have been thoroughly used. A brief description of the two platforms is reported in the following:
  - **InnovationPlace** is an online service supporting organisations to achieve their strategic R&D objectives through the matching and managing of R&D projects, organisations and grants. InnovationPlace is based on the Open Innovation paradigm, with the active involvement of industry leaders, multinational organisations, high-level research centres,

public bodies and innovative SMEs all around Europe. During the last years the number of users registered in the web platform has drastically increased and reached more than 10,000 organisations. The InnovationPlace platform plays a strategic role to implement an effective and efficient dissemination action for the MADFORWATER project, since it can reach more than 11,500 users registered on the platform and specifically focused on R&D projects (see Figure 2 and Table 1).

- **Ricerca & Innovazione** is the Italian Open Innovation platform that supports collaborative research through the successful combination of research and development projects, excellent European organisations and the most important public funding opportunities at European, national and regional level. The Ricerca & Innovazione platform can reach around 6,000 users coming from large industry, SME, public body, NGO and research centres at a national level (Italy) (see Figure *3* and Table 1).

Figure 1 Innovation Place's Twitter for MADFORWATER

Figure 2 Innovation Place

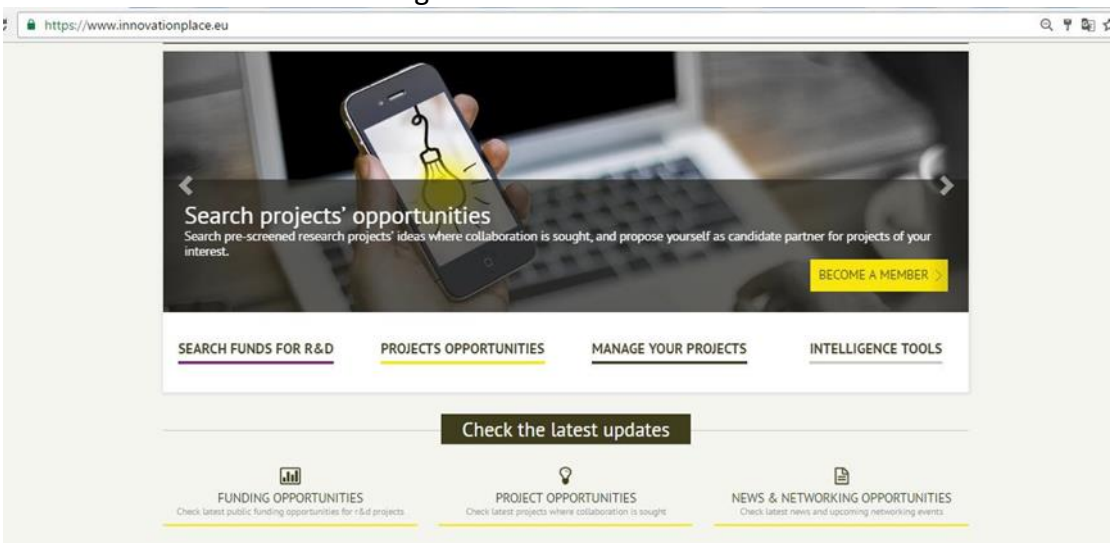


Figure 3 Ricerca & Innovazione

Table 1 MADFORWATER dissemination media channels used and audience reached by the given channel.

Channels	Link	Audience reached
MADFORWATER website	http://www.madforwater.eu/	The monthly number of views for this website is ~200.
MADFORWATER LinkedIn account	https://www.LinkedIn.com/company/10866865?trk=tyah&trkInfo=clickedVertical%3Acompany%2CclickedEntityId%3A10866865%2Cidx%3A1-1-1%2CtarId%3A1479383759492%2Ctas%3Amadforwa	Average number of views per published news: ~330
MADFORWATER Facebook account	https://www.facebook.com/madforwater/	Average number of views per published news: ~70
Innovation Place: CIAOTECH/PNO web-portal (Europe)	https://www.innovationplace.eu/	The monthly number of views for this website is ~2822.
Innovation Place newsletter		The number of subscribers for receiving the newsletter in their emailbox is 4756, divided in: • Scientific community Audience (Research organisations): 1308 • Industrial sector Audience (SME+ large industry) : 2195 • Civil society Audience (NGO): 172 • Other Audience (Other types of

		organisations including Public Body): 1081
Ricerca&innovazione: CIAOTECH/PNO web-portal (Italy)	http://www.ricercaeinnovazione.it/	The monthly number of views for this website is ~548.
Ricerca&innovazione newsletter		The number of subscribers for receiving the newsletter in their emailbox is 4628, divided in: • Scientific community Audience (Research organisations): 519 • Industrial sector Audience (SME+ large industry) : 2932 • Civil society Audience (NGO): 229 • Other Audience (Other types of organisations including Public Body):948
Facebook (By using the INNOVATION PLACE account)	https://www.facebook.com/innovation.place.pno?fref=pb&hc_location=profile_browser	Average number of views per published news: ~300
LinkedIn Innovation Place company page	https://www.LinkedIn.com/company/innovation-place	Average number of views per published news: ~160
Twitter Innovation Place	@INNOVATION_PL	Average number of views per published news: ~820
Twitter Ciaotech/PNO	@PNO_IT	Average number of views per published news: ~210
Twitter PNO consultants	@PNOconsultants	Average number of views per published news: ~1080

5.2 Dissemination activities carried out during months 1-18

The dissemination activities performed up to month 18 includes the following:

- **Articles**: 2 scientific articles, one published by UNIBO and one by NJU (see ANNEX 1: LIST OF SCIENTIFIC PUBLICATIONS).
- **Conferences/workshop attendance/ networking events:**
  - 36 international and national conferences including: *10th World Congress of Chemical engineering*; *2016 Conference of the ISEE: 'Transforming the Economy: Sustaining Food, Water, Energy and Justice*; *4th International Conference on Microbial Diversity 2017; 9th International Conference on Environmental Engineering and Management*, *ECOMONDO*;
  - 3 workshops: *International Workshop LINC Global-CCG on Global ChangeIndustry Water: From Single Use to Integrated Management*; *XXII Workshop on the Developments in the Italian PhD Research on Food Science Technology and Biotechnology*,
  - 4 other types of events: *H2020 infoday, Summer schools.*

We mention here only some of the events that partners attended up to now. The full list is reported in ANNEX 2: LIST OF DISSEMINATION ACTIVITIES.

Table 2 Some of the events already attended by MADFORWATER partners.

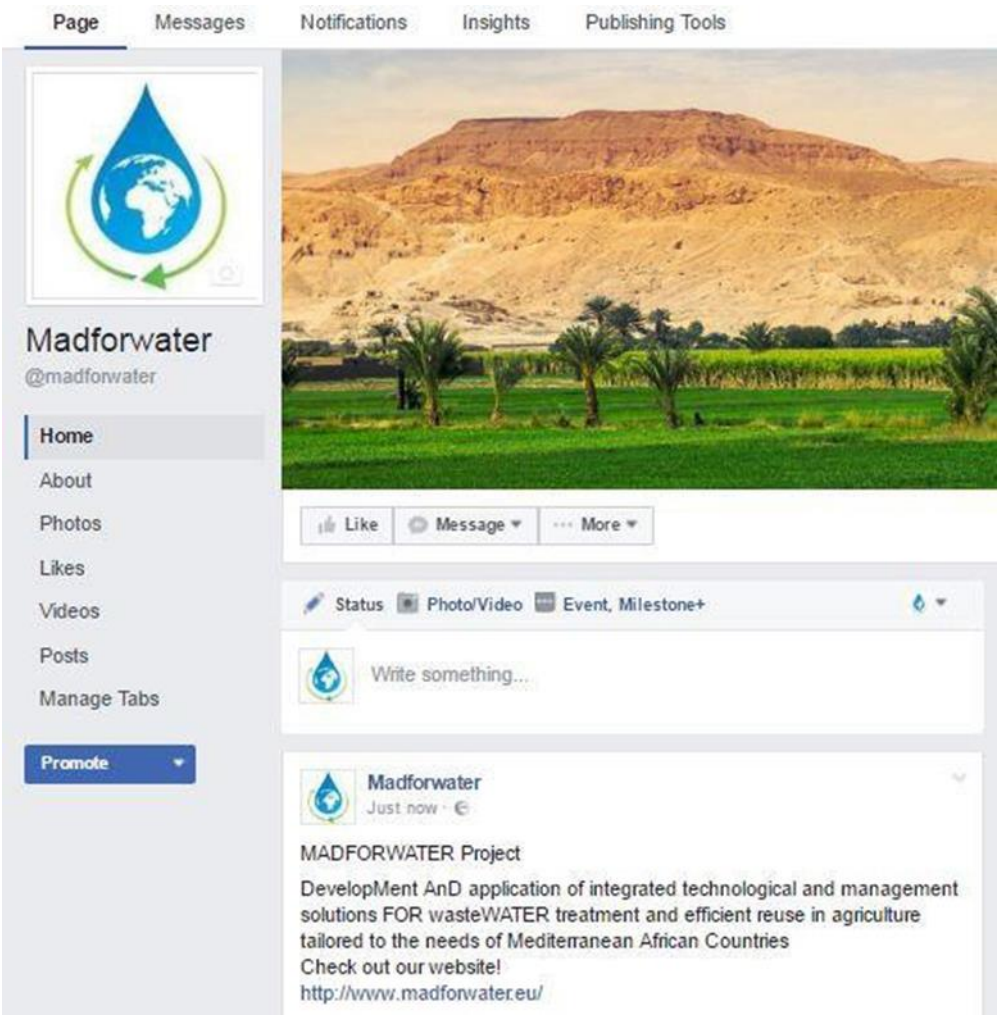
Event	Brief description	Results achieved
UN Climate Change Conference 2016, November 2016, Marrakech, Morocco	It is a yearly event included among one of the United Nations Climate Change Conferences, organised in the framework of the United Nations Framework Convention on Climate Change (UNFCCC). MADFORWATER participated in a European Commission side-event "Water-Energy-Food: research and innovation to address the nexus in the Mediterranean", aiming at bringing together institutional actors and research and innovation stakeholders to share insights into challenges and solutions for a low-carbon economy interlinked with sustainable management of resources.	Partners met these key contacts: -Faten Bahri, Embassy of Tunisia in the Netherlands -Omar Bessaoud, Jean-Paul Pellissier Centre des hautes Études Agronomiques Méditerranéennes, Institut Agronomique de Montpellier, CIHEAM - IAM During the event, the discussion focused specifically on the nexus challenges in the Mediterranean region.
AfriAlliance conference, South Africa, 22- 24 March 2017.	The AfriAlliance Action Groups and their areas of focus were presented during the conference; African research, innovation, policy and capacity development initiatives that are looking for European partners and vice versa were showcased.	AfriAlliance conference provided the opportunity to obtain inputs and suggestions for further shaping AfriAlliance's activities.

- **Stakeholder consultation workshops** (SCW): The Initial stakeholder consultation workshop took place on the 16th of December in Agadir, Morocco. Additional "country-specific" SCWs took place in Egypt on the 17th of November 2016, and in Tunisia on the 15-18th of May 2017 to overcome the logistic challenges in gathering a sufficient number of stakeholders from Egypt and Tunisia during the initial SCW that took place in Morocco.
- **Organisation of conferences/workshops/other events**: 15 workshops (6 in Egypt and 8 in Tunisia) and 2 conferences (one in China by NJU partner and another in Tunisia by UMA partner) have been set up. Some of the workshops involved meetings with several policy makers and members from NGO including: Slovenia Ambassador; Dr. Flavia Schlegel – ADG of UNESCO for Science and UNESCO office director in Egypt, US-Embassy representatives. Three other type of events have been organised by project partner UMA: one field visit to an Oil-mill, citrus field irrigated by TWW; one meeting with a supervisor in the Agriculture Ministry department of Water Valorization) and one meeting with a supervisor in the National Agency of Environmental Protection.
- **News on socials/platforms:** Short news (27 in total) reporting the project progresses, updates, relevant participation to the main events have been periodically prepared and widespread through the socials, project website, partners' website and platforms (see ANNEX 2: LIST OF DISSEMINATION ACTIVITIES).
- **Press release:** 11 press releases have been published on several newspapers and newsletters including: *Les Cahiers de l'Environnement, Elahram newspaper, NWRC newsletter, MENA Water Bulletin, Innovation place newsletter, Ricerca e innovazione newsletter, Water JPI newsletter*.
- **Communication campaign**: one description of the project in a Egyptian national TV program (Nile TV Channel) and one participation to the RAI3 Italian national television program "Geo".

Figure 4 MADFORWATER website

Figure 5 MADFORWATER LinkedIn

Figure 6 MADFORWATER Facebook



5.3 Dissemination materials to be produced during months 19-48

The dissemination materials to be produced in the next years are:

- **Newsletters**: Project updates and relevant news will be widespread to the wide audience through a newsletter produced every year, which will be translated in French and Arabic. Below the relevant issues that will be treated are reported:

Table 3 Newsletters still to be produced

Newsletter number	Month	Issues of newsletter
2	24	Updates on partners participation to relevant events (realised and planned) and updates on the second-year project results
3	36	Updates on partners participation to relevant events (realised and planned) and updates on the third-year project results
4	48	Updates on the final project results

- **Articles**: several non-scientific articles will be prepared for special magazines, such as Water JPI, EIP Water, H2O, Water Governance, NWP newsletter, Water Resources and Economics, Science Eaux et Territoire.

- **Videos**: technical videos (at least 5) aimed at presenting the project outcomes to a technical audience, as well as one professional-quality promotional-informative videos addressed to the general public, will be available on the project website, on YouTube and on the websites of the project partners. The videos will be realised when more results will be available to the consortium and more insights will be obtained, so that the stakeholder should be involved more closely in the project. The video will be sent to the stakeholders identified, and it will be uploaded on the MADFORWATER website and widely disseminated through all the dissemination channels.

5.4 Dissemination activities to be carried out during months 19-48

The dissemination activities to be carried out in the next years are:

- **Conferences/workshop attendance:** Partners will continue to disseminate findings through presentations at international research and professional conferences, such as IWA Leading Edge Conference on Water and Wastewater Technologies, International Phytotechnologies Conference, International Commission on Irrigation & Drainage Congress, IWRA World Water Congress, International Conference of Agricultural Economists, International Conference of the European Water Resources Association. Project partners will be involved in the organization during the 2017-2019 period of several conferences in which a wide visibility will be given to MADFORWATER: European Bioremediation Conference (Greece, 2018), IBS-EFB Joint Symposium (2019), Ecomondo (yearly symposium of the water and waste sectors, 1200 participating companies).
- **Final conference:** The consortium will organise a final scientific MADFORWATER event in the framework of a larger conference, in which the project's results will be presented and discussed with the attending stakeholder community.
- **Stakeholder Consultation workshop**: Mid-Project and Final workshops to be organised.
- **News on socials/ platforms:** Short press releases announcing the project progresses, updates, relevant participation to the main events will be periodically prepared and widespread through the socials, project website, partners' website and platforms.
- **Press release** aimed at European press and national journalists will be produced.

6 Dissemination activities tailored for the various categories of stakeholders

In the framework of an effective and well-structured project dissemination strategy, specific dissemination tools and activities have been foreseen and will be developed and carried out towards the various categories of stakeholders. The success of the MADFORWATER results to enter the market and the society is in fact based on the knowledge that the target audience has of the MADFORWATER project. In deliverable D7.1 "Report on stakeholder analysis and mapping", several target groups have been identified and categorised according to their characteristics, interests, attitude, influence and relevant knowledge for the project.

Table *4* shows the most effective dissemination tools, and channels tailored for each target group identified. We recall that, in D7.1, stakeholders have been defined as an organisation (physical or moral person in legal terms), which might be involved in or impacted by the project. The dissemination materials will be published and emails will be sent to stakeholders in three different languages (English, French, Arabic), according to the preference identified for each stakeholder in D7.1.

Table 4 Dissemination activities and tools selected for the different categories of stakeholders.

Category of stakeholders	Dissemination activities/ tools to address the given category of stakeholder
Commercial companies, coming from several sectors of activity / competencies (i.e. Agriculture, Waste water producers; Water resources management; Treated wastewater users; Environmental and social legal aspects; End-users & consumers).	To address this group, partners will: • **attend** events such as **fairs**; • prepare **posters** to present project results; • **publish papers** in non-scientific journal such as Industrial and agricultural journals/magazines: a list of journals already published by partners is reported in ANNEX 2: LIST OF DISSEMINATION ACTIVITIES; • Insert a direct link to MADFORWATER website on the **website of industrial partners** involved. Stakeholders from this group will: • Receive the **invitation** to the **final project conference.** Dissemination materials for this group include: • **MADFORWATER website;** • **project newsletter;** • **news on social network**: LinkedIn, twitter, Facebook; • **news on partners platforms**: Innovation Place, Ricerca & Innovazione, …; • MADFOWATER **electronic brochure**; • MADFORWATER **paper brochure**.
Academic and research institutes/universities: research groups dealing with the topic of the MADFORWATER approaches and technologies related to water reuse in agriculture, wastewater treatment and wastewater management, food security	To address this group, partners will: • **attend scientific** international **conferences**; • prepare **posters** to present project results; • **publish scientific open-access papers** in high impact journals: a list of papers already published by partners is reported in ANNEX 1: LIST OF SCIENTIFIC PUBLICATIONS ; • Insert a direct link to MADFORWATER website on the **website of scientific partners** involved. Stakeholders from this group will: • Receive the **invitation** to the **final project conference.** Dissemination materials for this group include: • **MADFORWATER website;** • **project newsletter;** • **news on social network**: LinkedIn, twitter, Facebook;

	• **news on partners platforms**: Innovation Place, Ricerca & Innovazione, …; • MADFOWATER **electronic brochure**; • MADFORWATER **paper brochure**; • MADFORWATER **technical video**.
Local/National/EU public authorities, bodies or governments: water efficiency in agriculture, water management and water related policy, as well as food security in the MAC are one of the key issues policy makers and citizens deal with today. For this reason, the audience for dissemination activities will include for example national or local policy makers, responsible for many decisions.	To address this group, partners will: • **publish press release on Popular journals/magazines.** Stakeholders from this group will: • Receive the **invitation** to participate to **"country-specific" SCWs;** • Receive the **invitation** to participate to Mid-Project and Final **SCWs.** Dissemination materials for this group include: • **MADFORWATER website;** • **project newsletter;** • **news on social network**: LinkedIn, twitter, Facebook; • **news on partners platforms**: Innovation Place, Ricerca & Innovazione, …; • MADFOWATER **electronic brochure**; • MADFORWATER **paper brochure**; • MADFORWATER **not technical video**; • **Connection with relevant Web portals**: The project results will be disseminated through various international platforms and web portals (EU and MAC).
Investors	This stakeholder group will be mainly addressed for exploitation activities (WP6).
(International) Associations & NGOs: Industrial and agricultural communities will be involved with the aim of maximising the suitability of the solutions, approaches and technologies proposed by MADFORWATER.	To address this group, partners will: • publish **press release on Industrial and agricultural journals/magazines.** Stakeholders from this group will: • Receive the **invitation** to participate to **"country-specific" SCWs;** • Receive the **invitation** to participate to Mid-Project and Final **SCWs.** Dissemination materials for this group include: • **MADFORWATER website;** • **project newsletter;** • **news on social network**: LinkedIn, twitter, Facebook; • **news on partners platforms**: Innovation Place, Ricerca & Innovazione, …;

	• MADFOWATER **electronic brochure**; • MADFORWATER **paper brochure**; • MADFORWATER **not technical video**; • Establish synergies for **organisation of SCWs** events; • Establish connection with relevant **Associations & NGOs Web portals**.
General public	Dissemination materials for this group include: • **MADFORWATER website;** • **project newsletter;** • **news on social network**: LinkedIn, twitter; • **news on partners platforms**: Innovation Place, Ricerca & Innovazione, …; • MADFOWATER **electronic brochure**; • MADFORWATER **paper brochure;** • MADFORWATER **not technical video**.
SAB (stakeholders' advisory board). The SAB includes a significant representation of Egyptian, Tunisian and Moroccan international organisations, water management agencies, ministries, WWTP management organisations, farmer associations and associations of industries (MAC-SAB) that will play a pivotal role in providing input on (i) the gaps and needs in the field of water in the target MACs, and (ii) the technical and cultural suitability for the local context of the MADFORWATER technologies, water management strategies and policies.	Stakeholders from this group will: • participate to **"country-specific" SCWs;** • participate to Mid-Project and Final **SCWs.**

ANNEX 1: LIST OF SCIENTIFIC PUBLICATIONS

Partner name	DOI	Type of publication	Repository link	Is this publication available in Open-Access, or will it be made available?	Peer-reviewed publication	Is this a joint public/ private publication?	Embargo period	Publication title	Title of the Journal/Proceedings/Books series/Book (for book chapters)	Year of publication
NJU	10.1016/j.watres.2017.01.009	Article in journal	https://zenodo.org/record/570958#.Wfx475CGOUm	No	Yes	Yes	24 months	Application of UV absorbance and fluorescence indicators to assess the formation of biodegradable dissolved organic carbon and bromate during ozonation	Water Research	2017
UNIBO	10.1155/2016/9349627	Article in journal	AMS Acta (www.amsacta.unibo.it)	Yes Gold Open Access	Yes	No		Batch and continuous flow adsorption of phenolic compounds from olive mill wastewater: a comparison between non-ionic and ion exchange resins.	International Journal of Chemical Engineering	2016

ANNEX 2: LIST OF DISSEMINATION ACTIVITIES

This appendix reports the table collected up to present for each partner to monitor the dissemination activities carried out during the project. For each activity, 23 columns are reported, divided in two consecutive pages:

1. Columns *#, Partner Name, Type of activity, Details of activity, Details of other, Title, Date, Place* are reported in the 1st page
2. Columns *Website, Journal/Magazine/Media name, Countries addressed, Audience reached by Media, Scientific community Audience, Industrial sector Audience, Civil society Audience, General Public Audience, Policy makers Audience, Investors Audience, Customers Audience, Other Audience* are reported in the 2nd page.

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
1	SKE	news/ publication	Websites different from project's website (posts on partners' websites)		Post on the website SKE A reference to the contribution of our company to the project with the link of project's website (http://www.madforwater.eu/)	nov-16	
2	UMIL	news/ publication	Communication Campaign (e.g. Radio, TV) (the project displayes its main contents on tv, radio, broadcasting shows.. and other)		Participation to the RAI3 television program "Geo". Microorganisms promoting the growth of plants in arid environments	04-03-2017; 14-04-2017	
3	UMIL	participation to event	Participation to a Workshop		XXII Workshop on the Developments in the Italian PhD Research on Food Science Technology and Biotechnology. Poster entitled "Bacterial mediated plant growth promotion: a strategy to reduce water footprint in agriculture"	20-22 Sept 2017	Università Libera di Bolzano, Italy
4	UMIL	participation to event	Participation to a Conference		ICEEM09, Circular Economy and Environmental Sustainability. oral presentation "Plant growth promoting bacteria: a sustainable tool to boost water footprint in agriculture"	6-9 Sept 2017	Alma Mater Studiorum Università di Bologna, Italy
5	UMIL	participation to event	Participation to a Conference		4th International Conference on Microbial Diversity 2017. oral presentation and extended abstract published in conference proceedings: "Plant growth promoting bacteria: a sustainable tool to minimize water footprint in agriculture in arid and semi-arid zones"	24-26 Oct 2017	University of Bari, Italy
6	UNIBO	participation to event	Participation to a Workshop		Industry Water: From Single Use to Integrated Management	20-apr-17	Bruxelles
7	UNIBO	participation to event	Participation to a Conference		Water Global Expo - Ecomondo 2016 Fair & congress. General presentation on the MADFORWATER project	8 November 2016	Rimini (Italy)
8	UNIBO	participation to event	Participation to a Conference		GRICU - The 2020 horizons of chemical engineering. Presentation of UNIBO results relative to WP2. Title: "RECOVERY OF PHENOLIC COMPOUNDS FROM OLIVE MILL WASTEWATER THROUGH AN ADSORPTION/DESORPTION PROCESS"	13 September 2016	Anacapri (Italy)
9	UNIBO	news/ publication	Press release (including newsletter)		Article in newsletter. MADFORWATER Horizon 2020 research project	November 2016	
10	UNIBO	participation to event	Participation to a Conference		9th International Conference on Environmental Engineering and Management. Presentation of UNIBO results relative to WP2. Title: "Olive mill wastewater valorisation through polyphenols adsorption and subsequent anaerobic digestion"	8 September 2017	Bologna (Italy)
11	UNIBO	participation to event	Participation to a Conference		9th International Conference on Environmental Engineering and Management. Presentation of UNIBO results relative to WP2. Title: "Carboxylates and biogas production from olive mill wastewater: kinetic studies"	7 September 2017	Bologna (Italy)
12	UNIBO	participation to event	Participation to a Conference		9th International Conference on Environmental Engineering and Management. Presentation of UNIBO results relative to WP2. Title: "Functioning and control of A.S. WWTPS under inflow variations due to a combined drainage system"	8 September 2017	Bologna (Italy)
13	UNIBO	participation to event	Participation to a Conference		10th World Congress of Chemical engineering. Presentation of UNIBO results relative to WP2. Title: "OLIVE MILL WASTEWATER VALORIZATION THROUGH POLYPHENOL ADSORPTION AND SUBSEQUENT ANAEROBIC DIGESTION"	3 October 2017	Barcelona (Spain)
14	UNIBO	participation to event	Participation to a Conference		10th World Congress of Chemical engineering. Poster presentation of UNIBO results relative to WP2. Title: "Treatment of municipal wastewater and drainage canal water by means of canalized facultative lagoons"	3 October 2017	Barcelona (Spain)
15	UNIBO	participation to event	Participation to a Conference		Water Global Expo - Ecomondo 2017 Fair & congress. General presentation on the MADFORWATER project	8 November 2017	Rimini (Italy)
16	UPM	participation to event	Participation to other events		THESys Summer School 2016: Transformative human-environment research & participatory methods: from co-production to co-producing. (The MADFORWATER Project was briefly introduced in the context of the following presentation: Varela-Ortega C. What role do scientists play in transforming human-environmental relations? Views from experiences in agro-environmental research. Invited presentation in public panel discussion. Transformative human-environment research & participatory methods: From co-production to co-producing. THESys Summer School 2016. IRI-THESYS (Integrative Research Institute on Transformations of Human-Environment Systems). Humboldt University, Berlin (DE). September 26-30, 2016.)	23-30/09/2016	Berlin, DE

#	Partner Name	Website	Journal/Magazine/Media name	Countries addressed	Audience reached by Media	Scientific community Audience	Industrial sector Audience	Civil society Audience	General Public Audience	Policy makers Audience	Investors Audience	Customers Audience	Other Audience
1	SKE	www.euromarket-cy.com		EU	8,100								
2	UMIL	http://www.raiplay.it/video/2017/02/Aspettando-Geo-Geo-80f8cdc7-1ebd-4e2e-81f5-3fad086dc065.html http://www.raiplay.it/video/2017/04/Aspettando-Geo---Geo-44f8fcdc-d20e-4ce3-b05e-7533b0b2125a.html	TV. RAI is the italian national public broadcasting company. National broadcasting	Italy	850,000								
3	UMIL	http://phdfood2017.events.unibz.it/		Italy		250							
4	UMIL	http://iceem.ro/		Worldwide		100							
5	UMIL	https://www.md2017.it/	Conference Proceedings (ISBN 978-88-943010-0-7)	Worldwide		100							
6	UNIBO	http://wsstp.eu/news/industry-water-from-single-use-to-integrated-management-workshop/		EU		20	15	0		10			
7	UNIBO	http://www.ecomondo.com/		EU		50	40	15	15	10			
8	UNIBO			Italy		250	10	0	.	0			
9	UNIBO	http://www.waterjpi.eu/newsletter/2016_01/files/assets/basic-html/page-4-5.html	Water JPI newsletter	EU		1000	500	0	0	100	50		
10	UNIBO	http://iceem.ro/		EU		200	20	15		15			
11	UNIBO	http://iceem.ro/		EU		200	20	15		15			
12	UNIBO	http://iceem.ro/		EU		200	20	15		15			
13	UNIBO	http://wcce10.org/		Worldwide		200	50	10		20			
14	UNIBO	http://wcce10.org/		Worldwide		500	75	20		20			
15	UNIBO	http://www.ecomondo.com/		EU		50	20	10		5			
16	UPM	https://www.iri-thesys.org/events/summer-school/2016		EU		40							

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
17	UPM	participation to event	Participation to a Conference		2016 Conference of the ISEE: 'Transforming the Economy: Sustaining Food, Water, Energy and Justice' (The MADFORWATER Project was briefly introduced in the context of the following communication: Varela-Ortega C., Esteve P., Blanco-Gutiérrez I. Long Term Perspectives on Water Use, Climate Change and Human Development in the Mediterranean. Presented at the 2016 Conference of the International Society for Ecological Economics (ISEE) 'Transforming the Economy: Sustaining Food, Water, Energy and Justice'.)	26-29/06/2016	Washington DC, USA
18	UPM	participation to event	Participation to a Workshop		International Workshop LINCGlobal-CCG on Global Change (The MADFORWATER Project will be introduced in the context of the following communication: Varela-Ortega C. Y Esteve, P. 'Water management and climate change impacts in agriculture in Mediterranean basins'. International Workshop LINCGlobal-CCG on Global Change. Consejo Superior de Investigaciones Científicas.)	24-26 May 2017	Madrid, Spain
19	UPM	Other Dissemination materials or activities	Flyer distributed in moments different than event		Informative leaflet with a short description of the M4W project, goals and expected impacts, produced and distributed by UPM during the THESys Summer School 2016: Transformative human-environment research & participatory methods: from co-production to co-producing.	26/09/2016	
20	UPM	Other Dissemination materials or activities	Other		Informative and detailed presentation of the M4W project within a series of research activities developed by the UPM team in Biodiversity International (a CGIAR research centre) and CATIE (Centro Agronómico Tropical de Investigación y Enseñanza)	15/09/2017-15/12/2017	San José, Costa Rica
21	UPM	participation to event	Participation to other events		High level event 'Harnessing Research and Innovation for FOOD 2030' that served to disseminate successful European Research and Innovation (R&I) initiatives and contribute to the ongoing science-policy dialogue in the area of Food Nutrition and Security. M4W Project was briefly introduced to some participants during the climate session and the networking session.	16/10/2017	Brussels, Belgium
22	UPM	Other Dissemination materials or activities	Flyer distributed in moments different than event		Master in food, agriculture and natural resource economics, Universidad Politécnica de Madrid	04/09/2017-30/11/2017	
23	UTM	organisation of event	Organisation of a Workshop		Meeting among researchers from UTM and partners from Global washing to discuss potential textile wastewater treatment technologies in the frame of M4W project	14/07/2016	Global WASHING, Korba, Tunisia
24	UTM	organisation of event	Organisation of a Workshop		SAB meeting between stakeholders and end-users to present MADFORWATER project and to discuss the possibilities for cooperation and interaction with Tunisian institutions.	21/07/2016	Tunis-Tunisia
25	UTM	organisation of event	Organisation of a Workshop		Workshop among researchers from UTM and UMA, and partners in the frame of Tunisian – South African research project to introduce the Tunisian contribution to MADFOWATER Project.	4-6/11/2016	Tunis-Tunisia
26	UTM	organisation of event	Organisation of a Workshop		Meeting among researchers from UTM and partners from INM (National Institute of Meteorology in the frame of MADFORWATER project to present MADFORWATER project and to discuss the possibilities for cooperation and interaction.	07/03/2017	INM, Tunis- Tunisia
27	UTM	participation to event	Participation to other events		H2020 infoday. Researchers from UTM participated to this event and introduced the Tunisian contribution to MADFOWATER Project	16/03/2017	Tunis-Tunisia
28	UTM	organisation of event	Organisation of a Workshop		SAB meeting among researchers from UTM, Stakeholders and end-users. Presentation of innovation and selection by Stakeholders. Co-construction of Drivers& hurdles to irrigate with treated waste water	16/05/2017	Tunis-Tunisia
29	UTM	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		MADFORWATER project announcement		
30	IAMB	participation to event	Participation to other events		WaterHeroes	21/22 March 2017	Marseilles
31	IAMB	participation to event	Participation to a Conference		Attualità dell'Idraulica Agraria e delle Sistemazioni Idraulico-Forestali al cambiare dei tempi	4/5 May 2017	Palermo

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17	UPM	http://www.isee2016.com/		Worldwide		100							
18	UPM	http://www.csic.es/lincglobal		EU		25							
19	UPM			EU		30							
20	UPM	https://www.bioversityinternational.org/ &cgiar.org		Worldwide		60							
21	UPM	http://ec.europa.eu/research/conferences/2017/food2030/index.cfm		EU		300	50	20	50	20			
22	UPM	https://mastereconomiaagraria.wordpress.com/		Worldwide									30
23	UTM			Tunisia		8							
24	UTM									10			
25	UTM			Mediterranean countries		70							
26	UTM			Tunisia		13							
27	UTM			Tunisia		20							
28	UTM						30						
29	UTM	https://www.researchgate.net/project/Coordinator-of-MADFORWATER-project-DevelopMent-AnD-application-of-integrated-technological-management-solutions-FOR-wasteWATER-treatment-efficient-reuse-in-agriculture-tailored-to-the-needs-of-Med	Researchgate website	EU		90							
30	IAMB	http://cmimarseille.org/highlights/waterheroes-%D8%A3%D8%A8%D8%B7%D8%A7%D9%84-%D8%A7%D9%84%D9%85%D9%8A%D8%A7%D9%87		Mediterranean countries		30	5	15					
31	IAMB	http://www.aiia.it/aiia_convegni/		Italy		100							

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
32	IAMB	participation to event	Participation to a Conference			8/11 October 2017	Bari
33	IAMB	participation to event	Participation to a Conference			26 October 2017	Valenzano
34	KWI	participation to event	Participation to a Conference		.IWA Flotation Conference	29.9.2016	Toulouse France
35	KWI	news/ publication	Press release		Traiter l'eau différement avec Krofta	september 2016	
36	KWI	participation to a Fair	Exhibition (participation of the project to an exhibition event with a stand/corner)		AQUATECH AMSTERDAM	31.10-3.11.2017	NL
37	NJU	participation to event	Participation to a Conference		Application of UV & fluorescence as indicators for the disinfection efficiency during ozonation treatment	22/10/2017	Hangzhou, China
38	NJU	organisation of event	Organisation of a Conference		The management of hazadous chemicals in China	13/10/2017	Nanjing, China
39	NWRC	organisation of event	Organisation of a Workshop		UNESCO Dr. Flavia Schlegel – ADG of UNESCO for Science & UNESCO office Director in Egypt	19/01/2017	NWRC facility, Egypt
40	NWRC	organisation of event	Organisation of a Workshop		Slovenia Ambassador to Egypt	09/04/2017	NWRC facility, Egypt
41	NWRC	organisation of event	Organisation of a Workshop		NSF Meeting with USA-NSF director of cooperation in NWRC facility	27/10/2016	NWRC facility
42	NWRC	news/ publication	Communication Campaign (e.g. Radio, TV) (the project displayes its main contents on tv, radio, broadcasting shows.. and other)		Description of the project in a national TV program	13/07/2016	
43	NWRC	news/ publication	Websites different from project's website (posts on partners' websites)		Project description in NWRC Web Site	01/08/2016	
44	NWRC	news/ publication	Press release		Press realease in Elahram news paper	09/07/2016	
45	NWRC	news/ publication	Press release		NWRC quarterly newsletter	30/07/2016	
46	NWRC	organisation of event	Organisation of a Workshop		WS for US-Embassy representatives	09/05/2017	NWRC facility
47	NWRC	organisation of event	Organisation of a Workshop		WS for US-Embassy representatives	19/09/2017	NWRC facility
48	NWRC	Other Dissemination materials or activities	Other	Summary of progress activties	Progress summary report	Every 3 months	Ministry's Institutions
49	NWRC	organisation of event	Organisation of a Workshop		WS for Chinese Representatives from Chinese Universities	05/10/2017	NWRC facility
50	UMA	organisation of event	Organisation of a Workshop		SAB meeting	21/07/2016	Tunis, Tunisia
51	UMA	organisation of event	Organisation of a Workshop		Local dissemination of UMA contribution to MADFOWATER Project; Laboratory seminar at UMA	01/10/2016	UMA- Tunisia

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32	IAMB	http://www.festivalacqua.org/blog/		Italy		20		150		15	15		
33	IAMB	http://www.iamb.it/en/news_and_events/news/one?event=recupero-e-riuso-delle-acque-reflue-tra-opportunita-e-criticita-per-una-gestione-sostenibile-dell-acqua-ciheam-bari-centro-documentale-26-ottobre-ore-16&id=113		Italy		25	5			10			
34	KWI	http://flotation2016.sciencesconf.org/		Worldwide		50	50						
35	KWI	https://www.lescahiers-environnement.info/	Les Cahiers de l'Environnement	EU	5,000								
36	KWI	https://www.aquatechtrade.com/amsterdam/		EU		60	240		2000				
37	NJU	http://www.environchem.org/		Worldwide		5000	1000	0	0	100	100	0	0
38	NJU	http://www.mepscc.cn/tabid/75/infoid/2569/frtid/40/default.aspx		Other		200	100	0	0	50	50	0	0
39	NWRC			Egypt		40							
40	NWRC			Egypt		35							
41	NWRC			Egypt		7							
42	NWRC		Nile TV Channel	Worldwide	1,000								
43	NWRC	www.nwrc-egypt.org		EU	10,000								
44	NWRC		Elahram news paper	Egypt	1,000								
45	NWRC		NWRC newsletter		500								
46	NWRC			Egypt									10
47	NWRC			Egypt									10
48	NWRC			Egypt						5			
49	NWRC			Egypt		20							
50	UMA			Tunisia			10						
51	UMA	https://www.facebook.com/pg/LR11ES31BVBGR/photos/?tab=album&album_id=12150602852 32954		Worldwide		30							

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
52	UMA	organisation of event	Organisation of a Workshop		M4W dissemination in TN-ZA project workshop, organised by UMA-UTM. 1ST TUNISIAN-SOUTH AFRICAN INTERNATIONAL-WORKSHOP "Microbial Ecology and Biotechnology In Stressful Environments"	4- 7 November 2016	UMA (ISBST)- Tunisia
53	UMA	organisation of event	Organisation of a Workshop		SAB meeting. Interaction between M4W partners and stakeholders of Mac partners	16/12/2016	Agadir-Morocco
54	UMA	participation to event	Participation to a Conference		International Congress of Environmental Science & Technologies 2017 "Energy Biotechnolgy Process Engineering Water and Waste Water Treatment	13 - 15 January 2017	Hammamet-Tunisia
55	UMA	organisation of event	Organisation of a Workshop		SAB meeting: MADFORWATER Tunisian stakeholders meeting	16/05/2017	Tunis, Tunisia
56	UMA	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		The 9th INTERNATIONAL CONFERENCE ON ENVIRONMENTAL ENGINEERING AND MANAGEMENT	6-9 September 2017	Bologna-Italy
57	UMA	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		M4w video presentation	07/12/2016	
58	UMA	news/publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Group photo of the participants in the 3rd project meeting	13/07/2017	
59	UMA	news/publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Dissemination of the project NL: 1st M4W newsletter	16/05/2017	Tunisia
60	UMA	organisation of event	organisation of other events (Brokerage event, exhibition etc)		Field visit to an Oil-mill, citrus field irrigated by TWW and the planned site of the WW treatment	17/05/2017	UMA- Chotrana- Bejaoua (Tunisia)
61	UMA	news/publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Dissemination of the project NL: 1st M4W newsletter	31/05/2017	
62	UMA	organisation of event	Organisation of a Conference		Problématiques de la réutilisation des eaux usées traitées ou non-conventionnelle en irrigation » presented by Dr. Ing. Nassim Ait Mouheb, Charged of research in- IRSTEA - UMR G-EAU.This conference was presented for ISBST students and researchers from the National Institute of Physico-chimical analyses (INRAP) and from the Faculty of sciences	04/10/2017	UMA-ISBST, Tunisia
63	UMA	organisation of event	organisation of other events (Brokerage event, exhibition etc)		meeting with a supervisor in the Agriculture Ministry department of Water Valorization		Tunisia
64	UMA	organisation of event	organisation of other events (Brokerage event, exhibition etc)		meeting with a supervisor in the National Agence of Environnemental Protection		Tunisa
65		news/ publication	Press release (including newsletter)		North Africa: Tackling water scarcity	February 2017	
66	IRSTE	participation to event	Participation to a Conference		JT Eau & Economie Circulaire	15/09/2017	Aix en Provence

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52	UMA	https://www.facebook.com/pg/LR11ES31BVBGR/photos/?tab=album&album_id=1255456677859981 http://www.isbst.rnu.tn/fra/articles/560/-1st-tunisian-south-african-international-workshop-		Worldwide		50							
53	UMA	http://www.madforwater.eu/news-and-events/second-project-meeting-agadir-morocco/		Mediterranean countries			25						
54	UMA	http://www.icest-congress.com/		Mediterranean countries			50	50					
55	UMA			Tunisia				30					
56	UMA	https://www.facebook.com/pg/LR11ES31BVBGR/photos/?tab=album&album_id=1296976200374695		Worldwide		30							
57	UMA	https://www.facebook.com/LR11ES31BVBGR/posts/1285443224861326	Facebook of Laboratoire de Biotechnologie et Valorisation des Bio-Géo Ressources	Worldwide		30							
58	UMA	https://www.facebook.com/LR11ES31BVBGR/photos/a.334963673242624.76735.293444994061159/1577543195651326/?type=3&theater		Montpellier, France		30							
59	UMA	https://www.facebook.com/pg/LR11ES31BVBGR/photos/?tab=album&album_id=1517365098335803 https://www.facebook.com/LR11ES31BVBGR/photos/a.334963673242624.76735.293444994061159/1506287486110231/?type=3		Tunisia		30	3						
60	UMA	https://www.facebook.com/LR11ES31BVBGR/posts/1508673995871580		Tunisia and Netherlands		UMA/ALTER	2		1				
61	UMA	https://www.facebook.com/LR11ES31BVBGR/photos/a.334963673242624.76735.293444994061159/1526686604070319/?type=3&theater http://www.annonces.rnu.tn/fr-en/index.php???=7&l=fr&dt=2017-06-16 http://www.annonces.rnu.tn/newsletter/index20170616.html		Worldwide					6000				
62	UMA	https://www.facebook.com/pg/LR11ES31BVBGR/photos/?tab=album&album_id=1674662802606031		Tunisia		85							
63	UMA			Tunisia						1			
64	UMA			Tunisia						1			
65		https://us9.campaign-archive.com/?u=ffcfd3a054815beb1e2d6a753&id=9ada757a7c&e=13502b1dd3	MENA Water Bulletin	EU									
66	IRSTE	http://www.ea-ecoentreprises.com/Actualites/Agenda-des-evenements/Manifestations-Ea/JT-Eau-Economie-Circulaire-Sept-2017		Mediterranean countries		40	20	10		50	5	5	

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67	IRSTE	participation to event	Participation to a Conference		Congrès Francophone de Techniques Laser	15/09/2016	Toulouse
68	IRSTE	participation to event	Participation to a Conference		Conference with ISBST Tunisie. During the event, the project MADFORWATER and its results were presented to researchers not involved in the MADFORWATER project, thus contributing to the dissemination of project results	04/10/2017	Tunise
69	IRSTE	participation to event	Participation to a Conference		Salon International de l'Agriculture	27/02/2017	Paris
70	IRSTE	participation to event	Participation to a Conference		Club "Gestion de l'eau en agriculture"	19/10/2017	Bordeaux
71	FHNW	participation to event	Participation to a Conference		TREATMENT OF TEXTILE WASTEWATER BY COMBINATION OF CHEMICAL AND BIOCATALYTIC METHODS	28/06/2017	Prague
72	FHNW	participation to event	Participation to a Conference		PHOTO- AND BIOCATALYTIC TREATMENT OF SELECTED FUNGICIDES IN WASTEWATER SAMPLES	07/09/2017	Bologna
73	IAV	participation to event	Participation to a Conference		Groundwater and global change in the western Mediterranean. Vulnerability of groundwater in Souss Massa region and alternative solutions for agriculture development. Oral presentation	5th to 10th November 2017	GRANADA SPAIN
74	IAV	participation to event	Participation to a Conference		Climate Chance Summit 2017 - The progress of Climate Action by Non-State Actors	11-13 September 2017	Agadir, Morocco
75	IAV	participation to event	Participation to a Conference		EWRA 2017: 10th World Congress on Water Resources and Environment. Climate change and water valuation in Souss-Massa region: Which management and adaptive measures. Oral presentation	5 to 9 July 2017	Athene, Greece
76	IAV	Other Dissemination materials or activities	Other	Thesis	Effect of treated wastewater on the growth and yield of two sweet corn varieties: impact of doses and systems of irrigation	Defended on the 10th of October	Valenzano Bari Italy
129	TUC	participation to event	Participation to a Conference		Conference presentation in 7th Mikrobiokosmos Conference 2017. Title "Development of microbial consortia for degradation of textile dyes."	7 - 9 April 2017	Athens, Greece
130	TUC	participation to event	Participation to a Conference		Conference presentation in 9th International Conference on Environmental Engineering and Management (PLANNED AND CONFIRMED ATTENDANCE) Title"Evaluation of a constructed wetland for wastewater treatment, with emphasis on the removal of emerging organic contaminants and antibiotic resistant bacteria"	6 – 9 September 2017	Bologna, Italy
131	TUC	participation to event	Participation to a Conference		Conference presentation in 14th International Phytotechnologies Conference (PLANNED AND CONFIRMED ATTENDANCE). Title "Evaluation of a pilot scale constructed wetland for municipal wastewater treatment, with empasis to bisphenol-A and pathogens removal"	25 - 29 September 2017	Montréal, Canada
132	TUC	participation to event	Participation to a Conference		Conference presentation in 14th International Phytotechnologies Conference (PLANNED AND CONFIRMED ATTENDANCE) Title "Cd, Ni and Zn removal efficiency of a pilot scale constructed wetland for municipal wastewater treatment"	25 - 29 September 2017	Montréal, Canada
133	ALTER	participation to event	Participation to a Conference	Mad4Water introduction movie	Water-Energy-Food Research and Innovation to address the nexus in the Mediterranean. Project presentation	15 November, 2016	Marrakesh

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67	IRSTE	http://www.afvl.fr/index.php/les-evenements/les-colloques/71-15e-cftl		France		70	30						
68	IRSTE			Tunisia		60	0	0	0	0	0	0	0
69	IRSTE			France		20	5	5		10			
70	IRSTE			France		10	6			6			
71	FHNW	http://biobio.vscht.cz/		Worldwide		300	50	10	360				
72	FHNW	http://iceem.ro/		Worldwide		300	50	10	360				
73	IAV	https://iah.org/events/congress-groundwater-global-change-western-mediterranean		Worldwide		300							
74	IAV			Worldwide		1000	500	2500	500	500			
75	IAV			Worldwide		600							
76	IAV			Italy		20							
129	TUC	http://www.mikrobiokosmos.org		EU		200							
130	TUC	http://iceem.ro/		EU		500							
131	TUC	http://www.ipc2017.org/		Worldwide		300							
132	TUC	http://www.ipc2017.org/		Worldwide		300							
133	ALTER			Worldwide		10	10	10	10	10			

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
134	ALTER	organisation of event	Organisation of a Workshop		1st Stakeholder meeting in the national Research Center in Cairo.	17 November, 2016	Cairo (Egypt)
135	ALTER	organisation of event	Organisation of a Workshop		1st Stakeholder Consultation Workshop Tunisia	15-18 May 2017	Tunis, Tunisia
136	ALTER	participation to event	Participation to a Conference	Mad4Water introduction movie	Water-Energy-Food Research and Innovation to address the nexus in the Mediterranean. Project presentation	22-24 03 2017	johanesburg
137	ALTER	participation to event	Participation to a Conference		Wastewater Reuse for Irrigation – unconventional or un-welcome resource? Local perceptions on barriers and drivers for reuse in Egypt, Morcco and Tunisia	22-26 10 2017	nantes, France
138	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Second Project meeting	13/012017	
139	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		MADFORWATER: Second Project meeting – Agadir, Morocco	11/01/2017	
140	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		First MADFORWATER project newsletter released!	08/06/2017	
141	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Ciaotech/PNO al 3° meeting del #MADFORWATER a Montpellier a luglio. Il prossimo sarà a dicembre 2017 a Bari. #water http://bit.ly/2y0ZWp4	14/09/2017	
142	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		#climatechange + population growth are expected to exacerbate water crisis in Africa. Read the story http://bit.ly/2qBlwhn #madforwater	18/05/2017	
143	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Our project #MADFORWATER was made possible thanks to #H2020 #InvestEUresearch! http://www.madforwater.eu	17/10/2017	
144	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Our project #MADFORWATER was made possible thanks to #H2020 #InvestEUresearch! http://www.madforwater.eu	17/10/1017	
145	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		@PNO_IT attended the 3rd MADFORWATER meeting in Montpellier in July. Read about this important project here: http://bit.ly/2x3gS0G #water	14/09/2017	
146	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		MADFORWATER: integrated solutions 4 wasteWATER treatment & reuse in agriculture for Med. African Countries, check at	05/10/2016	
147	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Enjoy reading the MADFORWATER project newsletter focusing on the first year results! #waterefficiency #agriculture	08/06/2017	
148	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Enjoy reading the MADFORWATER project newsletter focusing on the first year results! #waterefficiency #agriculture https://t.co/6LLrDIFxZk	08/06/2017	
149	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		@PNO_IT attended the 3rd MADFORWATER meeting in Montpellier in July. Read about this important project here: https://t.co/whX7dKA0ZI #water https://t.co/3wan3N363c	14/09/2017	
150	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		Our project #MADFORWATER was made possible thanks to #H2020 #InvestEUresearch! https://t.co/ae7I4G5HXu https://t.co/q6TXSErfmA	17/10/2017	
151	PNO	news/ publication	Social Media (posts on partners' social media channels,i.e. Linkedin, tweeter, fb...)		MADFORWATER gaat waterschaarste in Noord-Afrika aanpakken - en PNO helpt mee. Lees meer over dit bijzondere project http://ow.ly/maic306RdBE	06/12/2016	
152	PNO	news/ publication	Press release (including newsletter)		MADFORWATER first newsletter now available!	07/06/2017	
153	PNO	news/ publication	Press release (including newsletter)		MADFORWATER: Second Project meeting – Agadir, Morocco	11/01/2017	
154	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Have a look at the MADFORWATER project video presentation!	13/12/2016	

#	Partner Name	Website	Journal/Magazine/Media name	Countries addressed	Audience reached by Media	Scientific community Audience	Industrial sector Audience	Civil society Audience	General Public Audience	Policy makers Audience	Investors Audience	Customers Audience	Other Audience
134	ALTER			EU		11							
135	ALTER			Tunisia		24	1			5			
136	ALTER	afrialliance.eu		EU		150	50	150		50			
137	ALTER	s2samll2017.org		EU		150	50	150		50			
138	PNO	https://www.facebook.com/innovation.place.pno/	Company Facebook (Innovation Place)	EU	303								
139	PNO	https://www.linkedin.com/groups/4086674/4086674-6224985961084784644	Company LinkedIn (Innovation Place)	EU	153								
140	PNO	https://www.linkedin.com/groups/4086674	Company LinkedIn (Innovation Place)	EU	176								
141	PNO	https://twitter.com/PNO_IT/status/908254169810825216	Company Twitter (Ciaotech/PNO)	EU	183								
142	PNO	https://twitter.com/PNO_IT/status/865268611736317952	Company Twitter (Ciaotech/PNO)	EU	290								
143	PNO	https://twitter.com/PNO_IT/status/920202712444268550	Company Twitter (Ciaotech/PNO)	EU	163								
144	PNO	https://twitter.com/INNOVATION_PL/status/920202712502988800	Company Twitter (Innovation Place)	EU	3,371								
145	PNO	https://twitter.com/INNOVATION_PL/status/908254170070822912	Company Twitter (Innovation Place)	EU	153								
146	PNO	https://twitter.com/INNOVATION_PL/status/783661804144750592	Company Twitter (Innovation Place)	EU	836								
147	PNO	https://twitter.com/INNOVATION_PL/status/872793785843011585	Company Twitter (Innovation Place)	EU	336								
148	PNO	https://twitter.com/INNOVATION_PL/status/872793785843011585	Company Twitter (Innovation Place)	EU	336								
149	PNO	https://twitter.com/INNOVATION_PL/status/908254170070822912	Company Twitter (Innovation Place)	EU	93								
150	PNO	https://twitter.com/INNOVATION_PL/status/920202712502988800	Company Twitter (Innovation Place)	EU	610								
151	PNO	https://twitter.com/PNOconsultants/status/806119939660795904	Company Twitter (PNO consultants)	EU	1,085								
152	PNO		Innovation place newsletter	EU	4,756	0	0	0	0	0	0	0	0
153	PNO		Innovation place newsletter	EU	4,756			0	0	0	0	0	0
154	PNO	https://www.innovationplace.eu/news/Have-a-look-at-the-MADFORWATER-project-video-presentation!	Innovation Place website	EU	50,796	0	0	0	0	0	0	0	0

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
155	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		MADFORWATER: Second Project meeting – Agadir, Morocco	11/01/2017	
156	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		CiaoTech/PNO attended the third MADFORWATER project meeting in Montpellier, 3-5 July 2017	25/08/2017	
157	PNO	news / publication	Websites different from project's website (posts on partners' websites)		MADFORWATER: innovatief project moet waterschaarste Noord-Afrika aanpakken	30/11/2016	
158	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Horizon 2020: Projekt MADFORWATER	11/12/2016	
159	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Creating efficient and sustainable water supply and sanitation		
160	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Guarda il video di presentazione del progetto MADFORWATER	14/12/2016	
161	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		MADFORWATER: secondo meeting di progetto – Agadir, Marocco	13/01/2017	
162	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Ciaotech/PNO al terzo meeting del progetto MADFORWATER tenutosi a Montpellier (3-5 luglio 2017)	25/08/2017	
163	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		Enjoy reading our first project newsletter	08/06/2017	
164	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		MADFORWATER Project	05/10/2016	
165	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		Check out the page News and events to find out what's new on the MADFORWATER project website!	28/10/2016	
166	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		Second Project meeting	11/01/2017	
167	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		The 3rd meeting of the MADFORWATER project took place in Montpellier – France from the 3rd to the 5th of July 2017. During the meeting partners discussed different aspects related to the general advancement of the project. Specific attention was given to open access obligations, to the definition of suitable treatment trains for the different wastewater targeted by the project, to the preliminary results from the LCA and CBA of the project technologies, to the construction of a large stakeholder database. The last day of the meeting was devoted to the exploitation strategy seminar (ESS) held by the exploitation expert, Dr. Antonia Lorenzo. The ESS is a brainstorming exercise aimed at identifying and characterizing the most important exploitable results (or Key Exploitable results, KERs), including the evaluation of the risks and obstacles for their exploitation. In the coming weeks Dr. Antonia Lorenzo will prepare a report summarising the results of the seminar and providing recommendations for the future exploitation activities. The next meeting will be held in Bari in December 2017.	01/08/2017	

#	Partner Name	Website	Journal/Magazine/Media name	Countries addressed	Audience reached by Media	Scientific community Audience	Industrial sector Audience	Civil society Audience	General Public Audience	Policy makers Audience	Investors Audience	Customers Audience	Other Audience
155	PNO	https://www.innovationplace.eu/news/MADFORWATER:-Second-Project-meeting-%E2%80%93Agadir,-Marocco	Innovation Place website	EU	50,796	0	0	0	0	0	0	0	0
156	PNO	https://www.innovationplace.eu/news/ciaotech-pno-attended-the-third-madforwater-project-meeting-in-montpellier-3-5-july-2017	Innovation Place website	EU	50,796	0	0	0	0	0	0	0	0
157	PNO	http://www.pnoconsultants.nl/news/madforwater-innovatief-project-moet-waterschaarste-noord-afrika-aanpakken	PNO consultants Dutch website	EU	6,024								
158	PNO	http://www.pnoconsultants.de/%C3%BCber-pno/aktuelles/id/2082/horizon-2020-projekt-madforwater	PNO consultants German website	EU	5,621								
159	PNO	http://www.pnoconsultants.com/projects/madforwater/	PNO consultants website	EU	50,796								
160	PNO	http://www.pnoconsultants.it/news/id/2083/guarda-il-video-di-presentazione-del-progetto-di-madforwater	PNO Italy website	EU	9,864								
161	PNO	http://www.pnoconsultants.it/news/id/2118/madforwater-secondo-meeting-di-progetto-agadir-marocco	PNO Italy website	EU	9,864								
162	PNO	http://www.pnoconsultants.it/news/id/2393/ciaotechpno-al-terzo-meeting-del-progetto-madforwater-tenutosi-a-montpellier-3-5-luglio-2017	PNO Italy website	EU	9,864								
163	PNO	https://www.facebook.com/madforwater/	Project Facebook	EU	224								
164	PNO	https://www.facebook.com/madforwater/	Project Facebook	EU	10								
165	PNO	https://www.facebook.com/madforwater/	Project Facebook	EU	31								
166	PNO	https://www.facebook.com/madforwater/	Project Facebook	EU	28								
167	PNO	https://www.linkedin.com/feed/update/urn:li:activity:6298150821909528576	Project LinkedIn	EU	392								

#	Partner Name	Type of activity	Details of activity	Details of other	Title	Date	Place
168	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		Enjoy reading our first project newsletter: it focuses on updates on the MADFORWATER activities, a list of the conferences where MADFORWATER has been or will be presented and a wide description of our consortium! check it out in the page Public document at the link below https://lnkd.in/ewbArPg	08/06/2017	
169	PNO	news / publication	Project Social Media (posts on project social media channels,i.e. Linkedin, tweeter, fb...)		Second Project meeting Last December, the MADFORWATER partners met in Agadir (Morocco) for the second project meeting, to analyze the project activities implemented so far and plan the upcoming initiatives. After their internal meeting, on December 16 the project partners met about 20 Moroccan, Tunisian and Egyptian stakeholders, such as directors of wastewater management agencies and irrigation ministries, experts of basin authorities and members of NGOs. During the meeting, these stakeholders were informed about the goals and expected results of MADFORWATER and expressed their opinion on the needs and gaps in terms of water management and irrigation in Morocco, Tunisia and Egypt.	11/01/2017	
170	PNO	news/ publication	Video/Film		Project video presentation	14/12/2016	
171	PNO	news / publication	Project Website (posts, news, updates published on the project website)		MADFORWATER Project Kick-off meeting	29/08/2016	
172	PNO	news / publication	Project Website (posts, news, updates published on the project website)		MADFORWATER showcased at COP 22	21/11/2016	
173	PNO	news / publication	Project Website (posts, news, updates published on the project website)		Second Project meeting – Agadir, Morocco	13/01/2017	
174	PNO	news / publication	Project Website (posts, news, updates published on the project website)		MADFORWATER project: 3rd project meeting in Montpellier– France, 3 – 5 July 2017	01/08/2017	
175	PNO	news / publication	Project Website (posts, news, updates published on the project website)		MADFORWATER project: 3rd project meeting in Montpellier– France, 3 – 5 July 2017	01/08/2017	
176	PNO	news/ publication	Press release (including newsletter)		First project Newsletter in English		
177	PNO	news/ publication	Press release (including newsletter)		First project Newsletter in French		
178	PNO	news/ publication	Press release (including newsletter)		First project Newsletter in Arabic		
179	PNO	news/ publication	Press release (including newsletter)		Guarda il video di presentazione del progetto MADFORWATER	13/12/2016	
180	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Guarda il video di presentazione del progetto MADFORWATER	13/12/2016	
181	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		MADFORWATER: secondo meeting di progetto – Agadir, Marocco	13/01/2017	
182	PNO	news/ publication	Websites different from project's website (posts on partners' websites)		Ciaotech/PNO al terzo meeting del progetto MADFORWATER tenutosi a Montpellier (3-5 luglio 2017)	25/08/2017	
183	PNO	participation to event	Participation to a Conference		ECOMONDO, special session on WATER "'Stakeholders mapping, cost-benefit analysis and business models concerning water technologies and water reuse"	08/11/2017	Rimini (IT)
184	PNO	participation to event	Participation to a Conference		ICEEM	09/09/2017	Bologna (IT)

#	Partner Name	Website	Journal/Magazine/Media name	Countries addressed	Audience reached by Media	Scientific community Audience	Industrial sector Audience	Civil society Audience	General Public Audience	Policy makers Audience	Investors Audience	Customers Audience	Other Audience
168	PNO	https://www.linkedin.com/feed/update/urn:li:activity:6278555874202042368	Project LinkedIn	EU	230								
169	PNO	https://www.linkedin.com/feed/update/urn:li:activity:6224986411758559232	Project LinkedIn	EU	358								
170	PNO	http://www.madforwater.eu/	Project website	EU	3,000	0	0	0	0	0	0	0	0
171	PNO	http://www.madforwater.eu/news-and-events/madforwater-project-kick-off-meeting/	Project website	EU	3,000	0	0	0	0	0	0	0	0
172	PNO	http://www.madforwater.eu/news-and-events/madforwater-showcased-cop-22/	Project website	EU	3,000	0	0	0	0	0	0	0	0
173	PNO	http://www.madforwater.eu/news-and-events/second-project-meeting-agadir-morocco/	Project website	EU	3,000	0	0	0	0	0	0	0	0
174	PNO	http://www.madforwater.eu/news-and-events/madforwater-project-3rd-project-meeting-montpellier-france-3-5-july-2017/	Project website	EU	3,000			0	0	0	0	0	0
175	PNO	http://www.madforwater.eu/news-and-events/madforwater-project-3rd-project-meeting-montpellier-france-3-5-july-2017/	Project website	EU	3,000	0	0	0	0	0	0	0	0
176	PNO	http://www.madforwater.eu/public-documents/	Project website	EU	3,000	0	0	0	0	0	0	0	0
177	PNO	http://www.madforwater.eu/public-documents/	Project website	EU	3,000	0	0	0	0	0	0	0	0
178	PNO	http://www.madforwater.eu/public-documents/	Project website	EU	3,000	0	0	0	0	0	0	0	0
179	PNO		Ricerca e innovazione newsletter	Italy		0	0	0	0	0	0	0	0
180	PNO	https://www.ricercaeinnovazione.it/news/Guarda-il-video-di-presentazione-del-progetto-di-MADFORWATER!-	Ricerca e Innovazione website	EU	9,864	0	0	0	0	0	0	0	0
181	PNO	https://www.ricercaeinnovazione.it/news/MADFORWATER:-secondo-meeting-di-progetto-%E2%80%93-Agadir,-Marocco	Ricerca e Innovazione website	EU	9,864	0	0	0	0	0	0	0	0
182	PNO	https://www.ricercaeinnovazione.it/news/ciaotech-pno-al-terzo-meeting-del-progetto-madforwater-tenutosi-a-montpellier-3-5-luglio-2017	Ricerca e Innovazione website	EU	9,864	0	0	0	0	0	0	0	0
183	PNO	http://www.ecomondo.com/		EU		40	30	10		5			
184	PNO	http://iceem.ro/		EU		100	0						

ANNEX 3: MADFORWATER brochure

Development and application of integrated technological and management solutions for wastewater treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries: the MADFORWATER project

Why

Mediterranean African Countries (MACs) face a relevant water crisis, due to low water availability per capita, insufficient rate of wastewater treatment, overexploitation of renewable water resources, high demand of water for agriculture and non-optimized irrigation practices.
In the next decades, population and economic growth combined with climate change will make the situation even more dramatic, unless significant and rapid actions are taken.

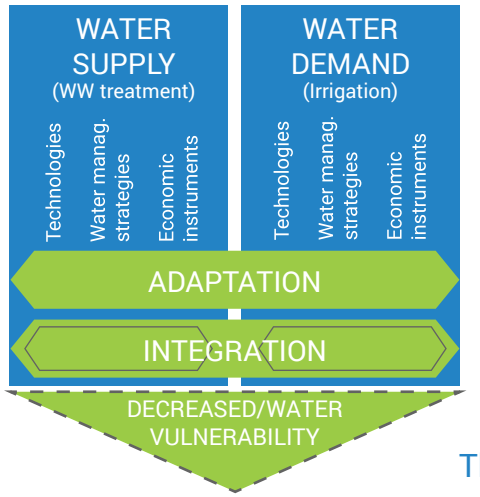
Aims of MADFORWATER

General goal

to develop integrated technological and management solutions to boost wastewater treatment and treated wastewater efficient reuse for irrigation in selected hydrological basins in Egypt, Morocco and Tunisia.

Specific goals

- improved analysis of water vulnerabilities in Egypt, Morocco and Tunisia
- development of technologies for wastewater treatment and agricultural reuse
- development of integrated water & land management strategies
- increased capacity building in relation to water management
- promotion of business opportunities for water & irrigation enterprises.



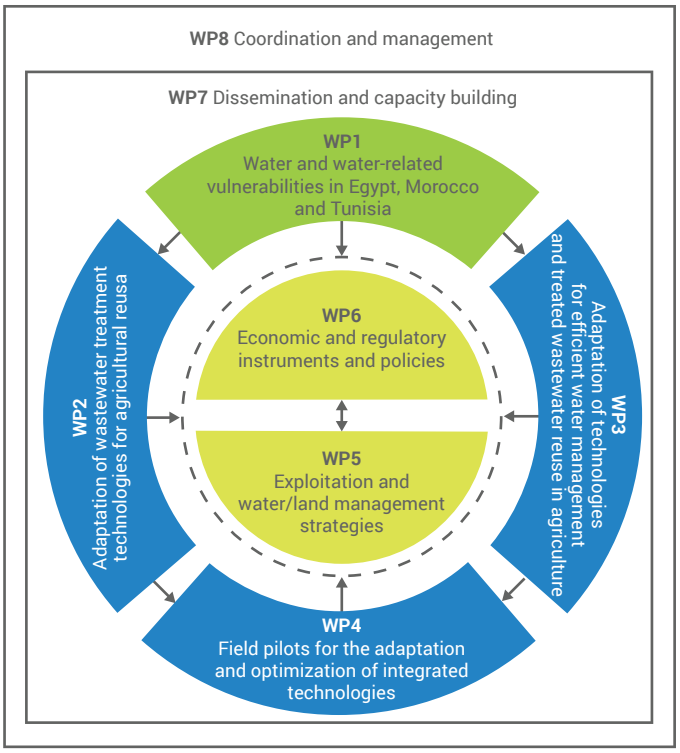
The MADFORWATER concept

- Madforwater is based on 2 pillars: **water supply (wastewater treatment) and water demand (irrigation)**
- Transversal key concepts:
  - **adaptation** to the local conditions of the 3 target MACs
  - **integration** (i) within each pillar, between technologies, water management strategies and economic instruments; (ii) transversally, between wastewater treatment and wastewater reuse for irrigation

The MADFORWATER technologies

Wastewater treatment technologies		Irrigation technologies
Canalized lagoon with nitrification/denitrification capacity	Phenolic compounds adsorption + anaerobic digestion	Low-pressure micro-sprinklers and calibrated nozzles adapted to treated WW
Nitrifying trickling filters	Aerobic sequenced batch reactor	Re-engineered surface irrigation systems
Constructed wetlands with plant growth promoting bacteria	Granulated sludge bioreactor	Large spectrum soil moisture sensor calibrated for saline water
Enzymatic degradation of emerging pollutants, dyes and fungicides	Flotation + Moving Bed Biological Reactor (integrated)	Supply of plant growth promoting bacteria to increase crop resistance to water scarcity
Catalytic disinfection beds activated by solar UV light	Dyes adsorption with innovative resins	Open source software tool to determine the optimal irrigation amount and schedule

The MADFORWATER strategy



The project is articulated into 3 main phases:

Analytical phase

evaluation of the water vulnerabilities in the 3 target countries

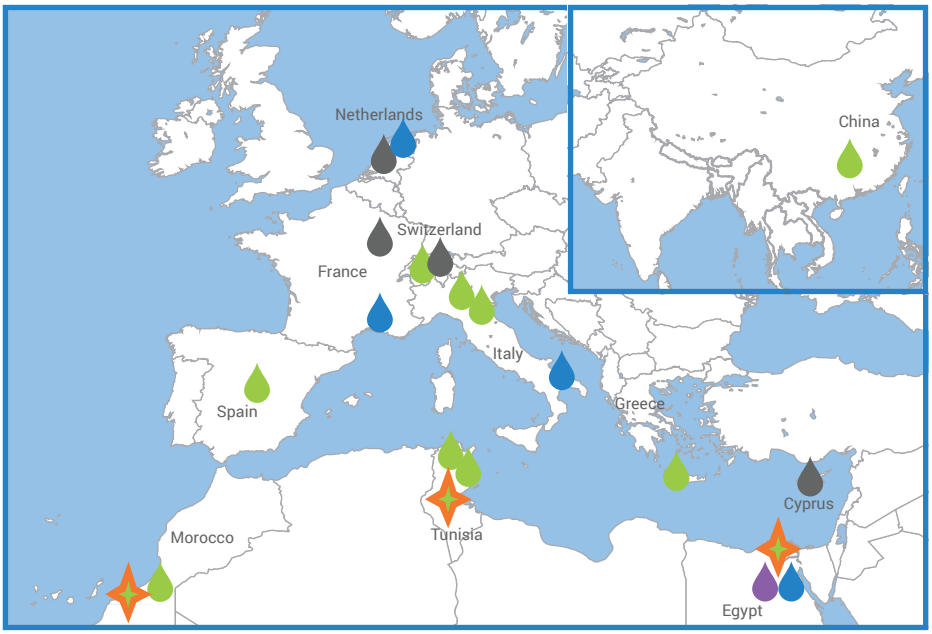
Technological phase

lab-scale development and adaptation of technologies; implementation of the best technologies in 4 demonstrator plants of wastewater treatment and agricultural reuse

Implementation phase

decision support tools, basin-scale water management strategies, policy recommendations, capacity building, industrial exploitation

The MADFORWATER consortium



- University
- Research Institute
- SME
- International Organization
- Location hosting pilot plants

University of Bologna (Italy)
University of Manouba (Tunisia)
Technical University of Crete (Greece)
University of Tunis El Manar (Tunisia)
University of Applied Sciences and Arts Northwestern Switzerland
Agronomic and Veterinary Institute Hassan II (Morocco)
University of Milano (Italy)
Nanjing University (China)
Technical University of Madrid (Spain)

Wageningen Environmental Research (Netherlands)
Mediterranean Agronomic Institute of Bari (Italy)
NWRC - Ministry of Water Resources and Irrigation (Egypt)
IRSTEA (France)

PNO Innovatieadvies (Netherlands)
S.K. Euromarket Ltd (Cyprus)
Krofta Waters International (Switzerland)
ROLLAND Arroseurs Sprinklers (France)

FAO Regional Office for Near East and North Africa

Coordinator: Dario Frascari (dario.frascari@unibo.it); co-coordinator: Giulio Zanaroli (giulio.zanaroli@unibo.it); www.madforwater.eu

The 4-year project MADFORWATER (June 2016 - May 2020)
is a Research and Innovation Action of the Horizon 2020 program (GA No 688320).

ANNEX 4: MADFORWATER poster template

Partner Logo

Poster Title here

Author 1*[(1)]*, Author 2* [(2)]*, ...

[(1)] *Department of ....., University of ....*

Background

Mediterranean African Countries (MACs) face a relevant water crisis, due to low water availability per capita, insufficient rate of wastewater treatment, overexploitation of renewable water resources, high demand of water for agriculture and non-optimized irrigation practices. In the next decades, population and economic growth combined with climate change will make the situation even more dramatic, unless significant and rapid actions are taken. In response to this crisis, the general goal of the **MADFORWATER project** is to develop integrated technological and management solutions to boost wastewater treatment and treated wastewater efficient reuse for irrigation in selected hydrological basins in Egypt, Morocco and Tunisia.

Specific aim of this work

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1 - Title

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Conclusion

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MADFORWATER: Development and application of integrated technological and management solutions for wastewater treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries

This project has received funding from the European Union's Horizon 2020 Research and Innovation program under Grant Agreement n° 688320

www.madforwater.eu

ANNEX 5: MADFORWATER introductory presentation

EU funded Project

MADFORWATER

DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries

Research and Innovation Action: Grant Agreement n° 688320

Introduction to the project

Madforwater at a glance

MADFORWATER

EU funded Project

- **Societal Challenge**: Climate Action, Environment, Resource Efficiency and Raw Materials (SC5)
- **Topic**: WATER-5c-2014/2015 - Strengthening international R&I cooperation in the field of water. Development of water supply and sanitation technology, systems and tools, and/or methodologies
- **Starting date**: 1 June 2016.
- **Duration**: 4 years
- **Total cost**: 4.039.419 €
- **EU funding**: 2.914.419 €
- **Coordinator**: Dr. Dario Frascari, University of Bologna
- **Co-coordinator**: Dr. Giulio Zanaroli, University of Bologna

The Madforwater **consortium**

MADFORWATER

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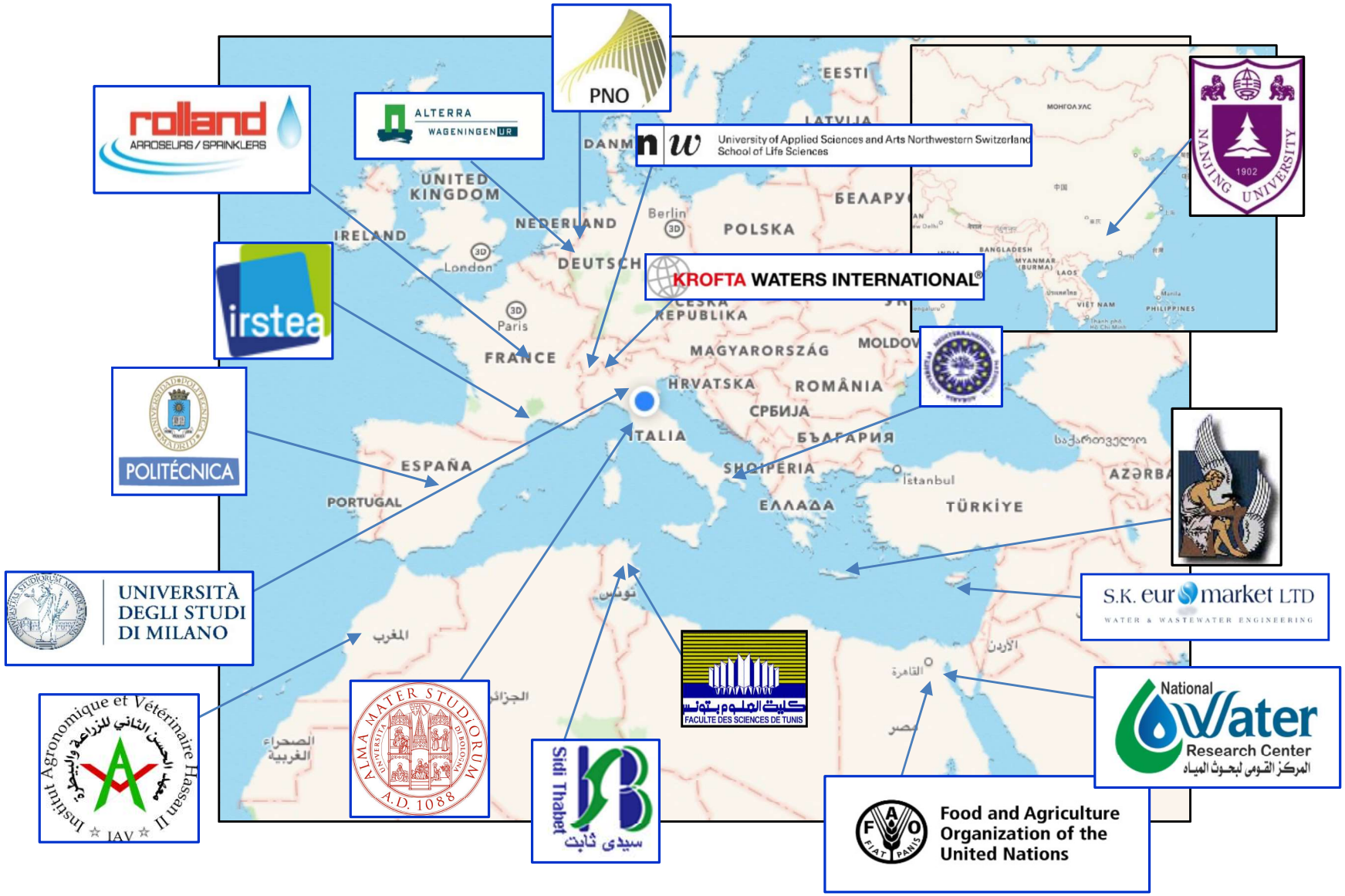
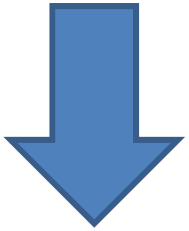
- 18 partners: 13 research insitutions, 4 SMEs, 1 international organization (FAO)
  - 11 countries
  - 5 partners from MACs



General goal



To develop an integrated set of technological and management instruments for the enhancement of wastewater treatment, treated wastewater reuse for irrigation and water efficiency in agriculture, with the final aim to reduce water vulnerability in selected basins in Egypt, Morocco and Tunisia.

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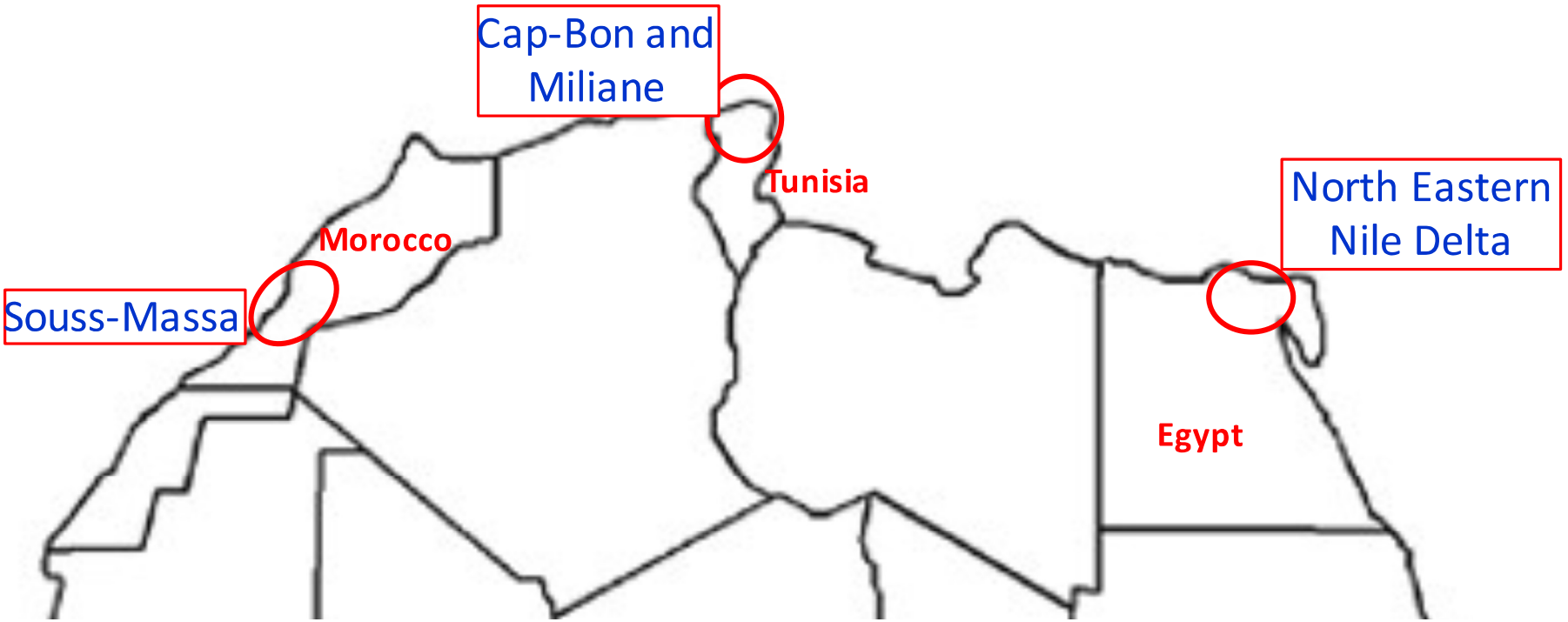
The selected basins



MADFORWATER

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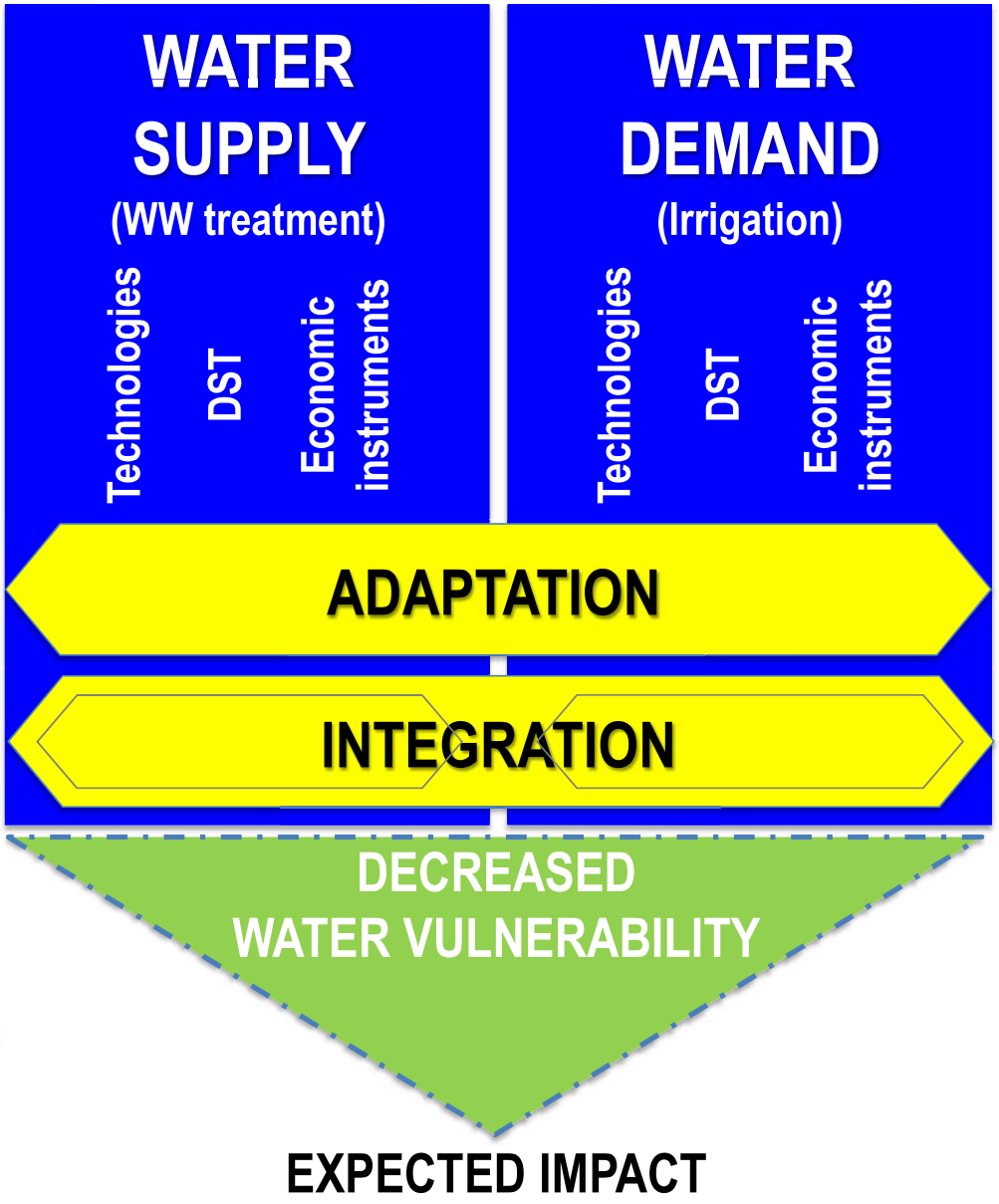
The Madforwater **concept**



- Madforwater is based on 2 main pillars: **water supply (wastewater treatment) and water demand (irrigation)**
- The actions related to these 2 pillars will be transversally characterized by the concepts of
  - ✓ **adaptation** to the local conditions of the 3 target MACs
  - ✓ **integration** (i) within each pillar, between technologies, water management strategies and economic instruments; and (ii) transversally, between WW treatment and WW reuse for irrigation

MADFORWATER

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Specific objectives and expected results

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IMPROVED IDENTIFICATION OF WATER VULNERABILITIES SO1

EXPECTED RESULTS:

- Report on the **international cooperation agreements related to water management in the target MACs**
- Country-wide **GIS maps describing water stress, water vulnerability and water reuse potential** in the target countries
- Technical description of the **effects of water vulnerabilities on food security and socio-economic development** in the target MACs
- Basin-scale **water vulnerability assessment framework** for the evaluation of the effectiveness of integrated water management strategies

Specific objectives and expected results

MADFORWATER

EU funded Project

IMPROVED IDENTIFICATION OF WATER VULNERABILITIES SO1

DEVELOPMENT, ADAPTATION AND INTEGRATION OF TECHNOLOGIES FOR WW TREATMENT AND WATER EFFICIENT USE IN AGRICULTURE **SO2**

EXPECTED RESULTS:

- **11 wastewater treatment technologies**, tailored to the 3 selected basins and validated at laboratory scale
- **6 technologies for increasing water efficiency and reuse in agriculture**, tailored to 3 selected basins and validated at laboratory scale
- **4 field pilot plants of integrated wastewater treatment and water reuse in agriculture**, operated in the 3 selected basins

Specific objectives and expected results

MADFORWATER

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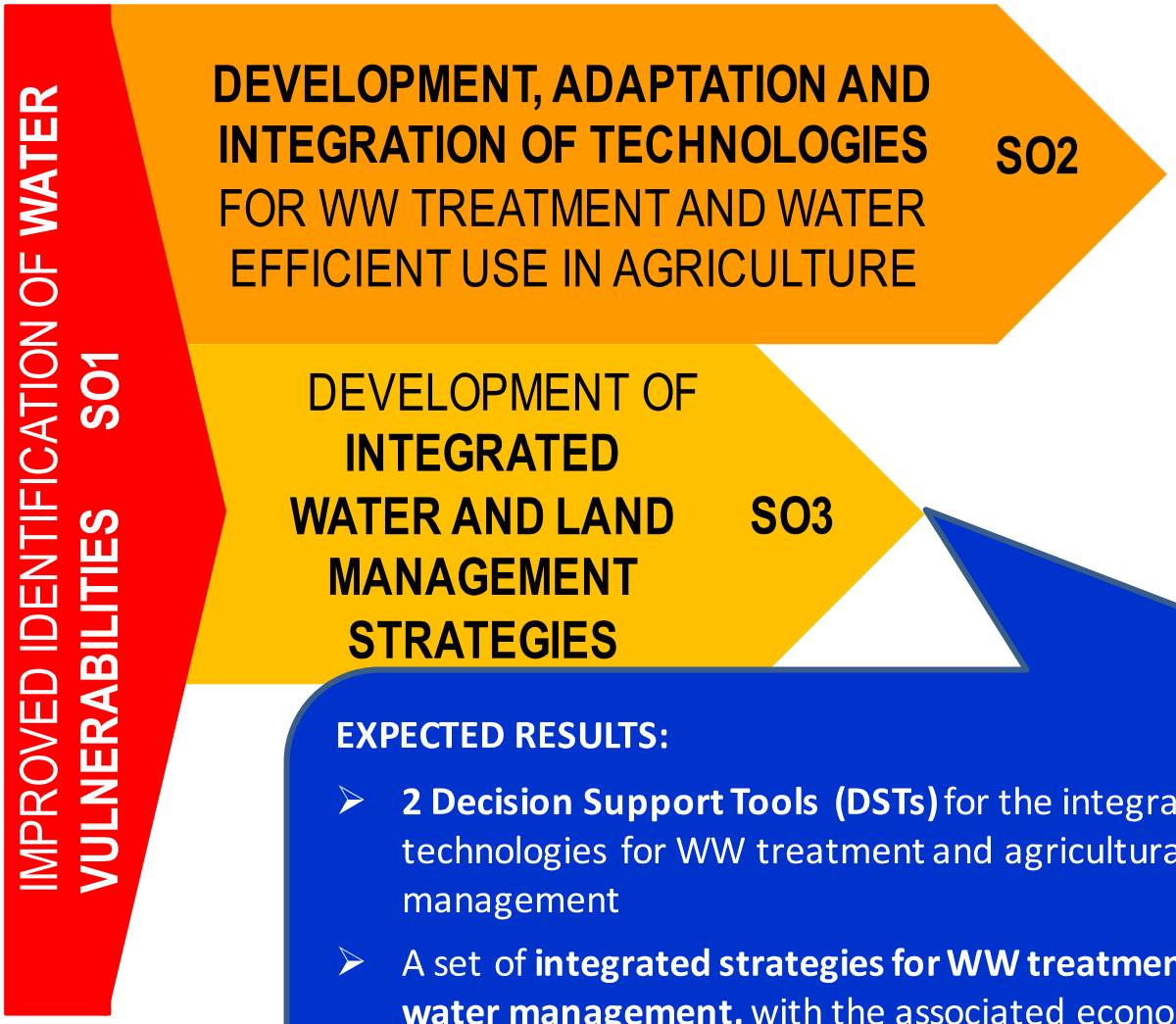

EXPECTED RESULTS:

- **2 Decision Support Tools (DSTs)** for the integration of the project technologies for WW treatment and agricultural water & land management
- A set of **integrated strategies for WW treatment and agricultural water management,** with the associated economic instruments, targeted to the 3 selected basins
- **Policy recommendations** for the effective implementation of the proposed water management solutions in the 3 target MACs

Specific objectives and expected results

MADFORWATER

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IMPROVED IDENTIFICATION OF **WATER VULNERABILITIES** **SO1**

DEVELOPMENT, ADAPTATION AND INTEGRATION OF TECHNOLOGIES FOR WW TREATMENT AND WATER EFFICIENT USE IN AGRICULTURE **SO2**

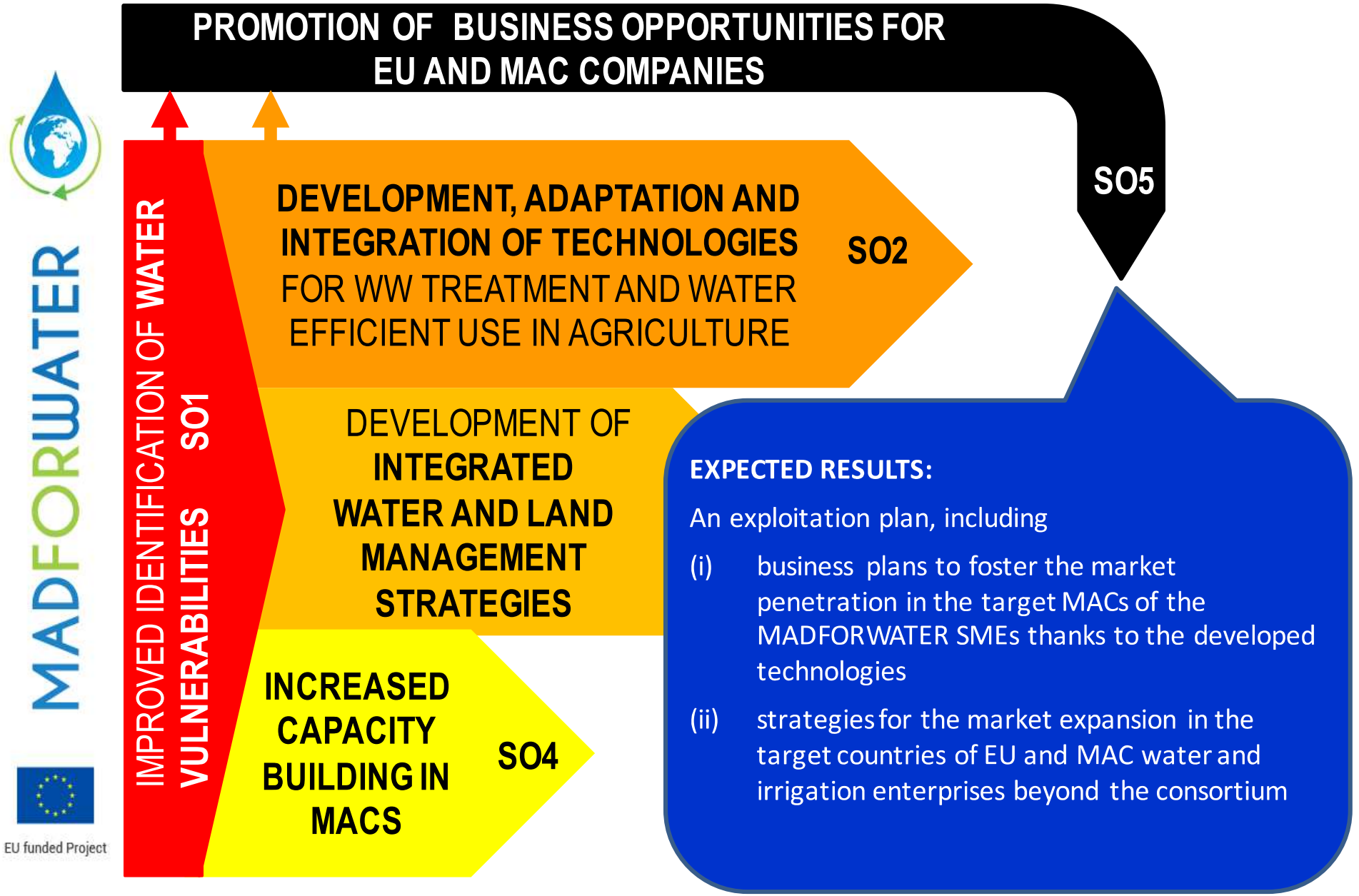
DEVELOPMENT OF **INTEGRATED WATER AND LAND MANAGEMENT STRATEGIES** **SO3**

INCREASED CAPACITY BUILDING IN MACS **SO4**

EXPECTED RESULTS:

- **A technical booklet and a set of technical** videos on the MADFORWATER WW treatment, efficient irrigation and water reuse technologies
- 3 Stakeholder Consultation Workshops, 2 Capacity Building Workshops, 1 train-the-trainer course, 4 on-field trainings at the project pilots, exchange of scientists, field visits, technical and dissemination videos, 1 final project conference.

Specific objectives and expected results



MADFORWATER

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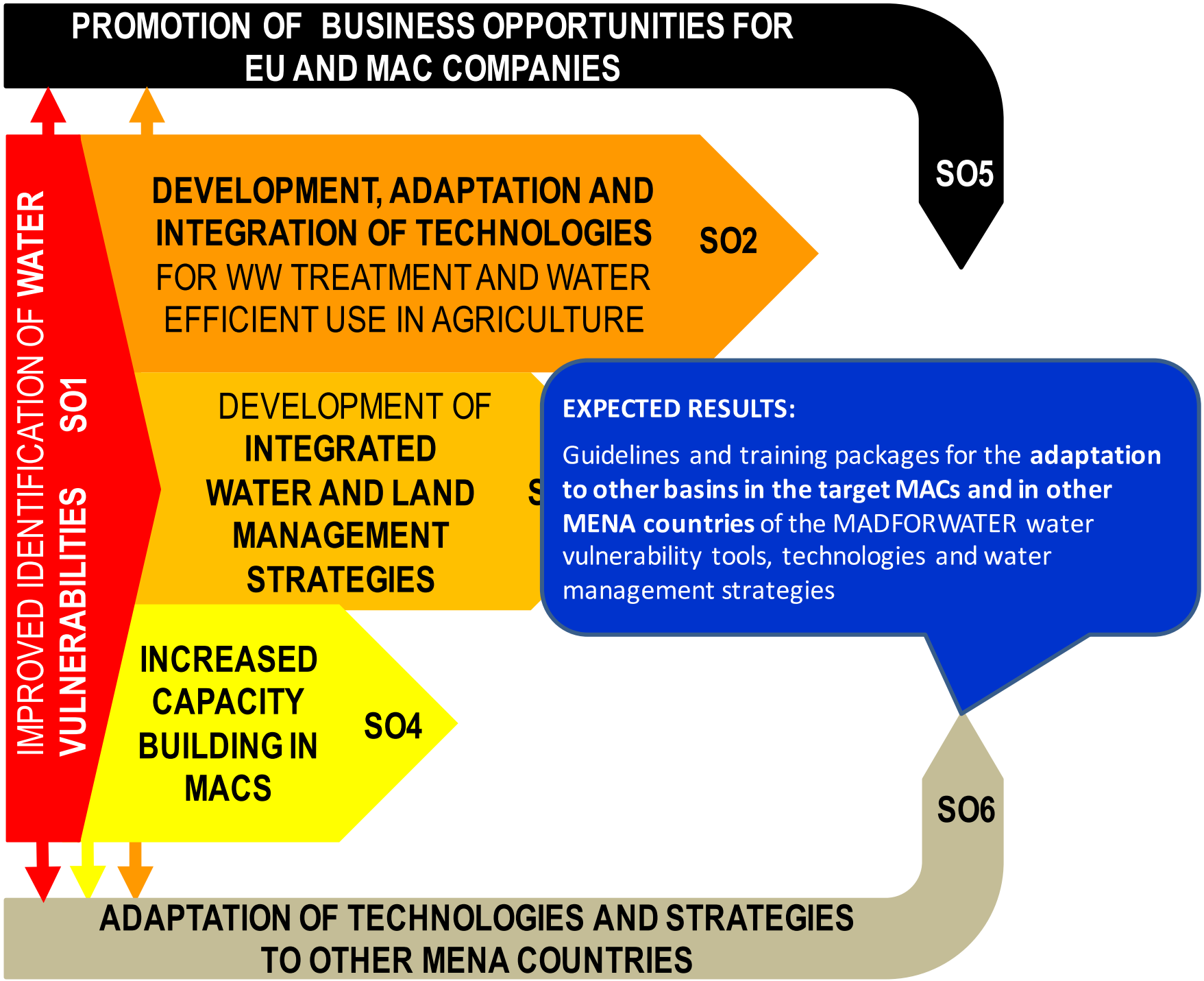
Specific objectives and expected results



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The Madforwater **strategy**

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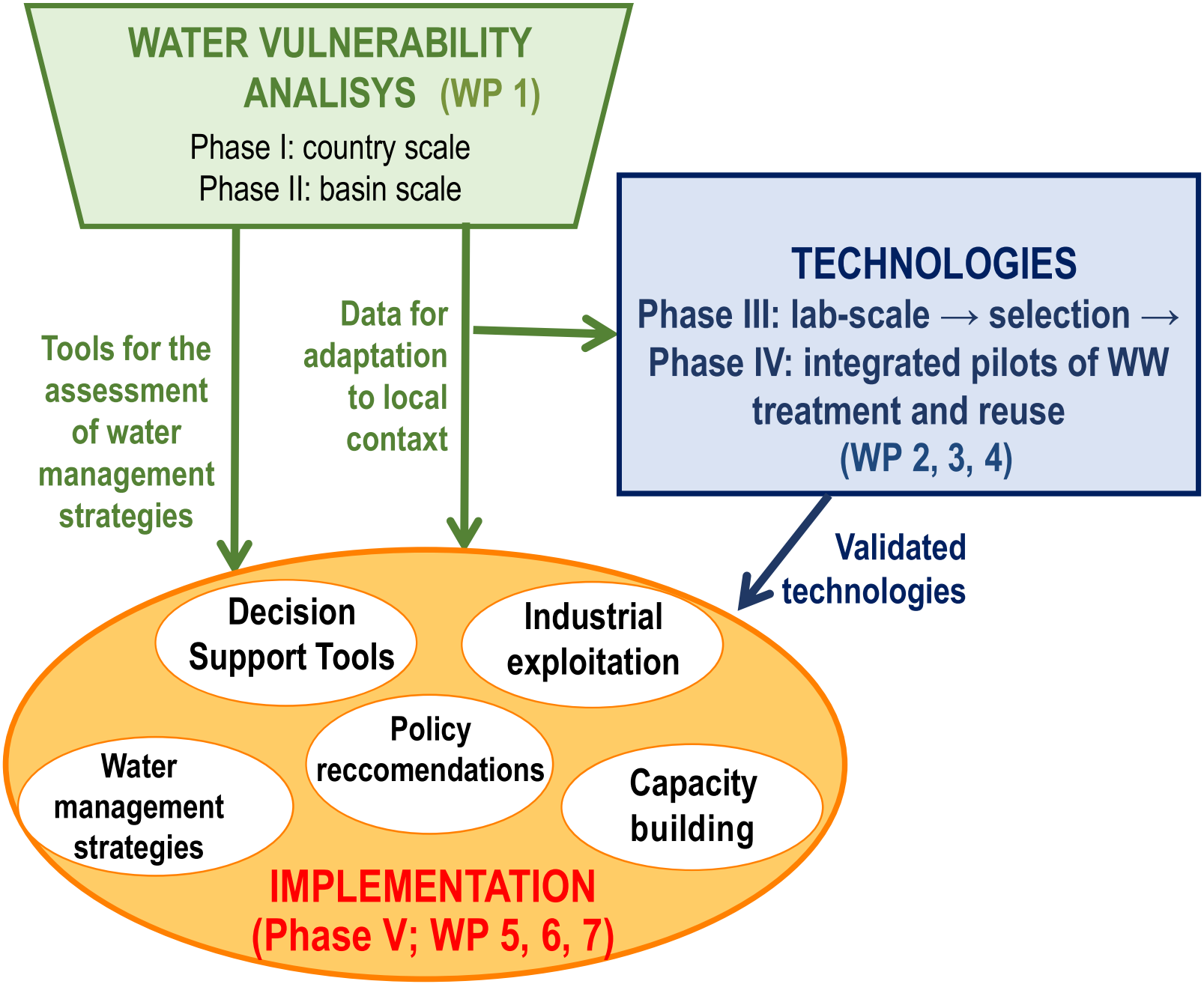
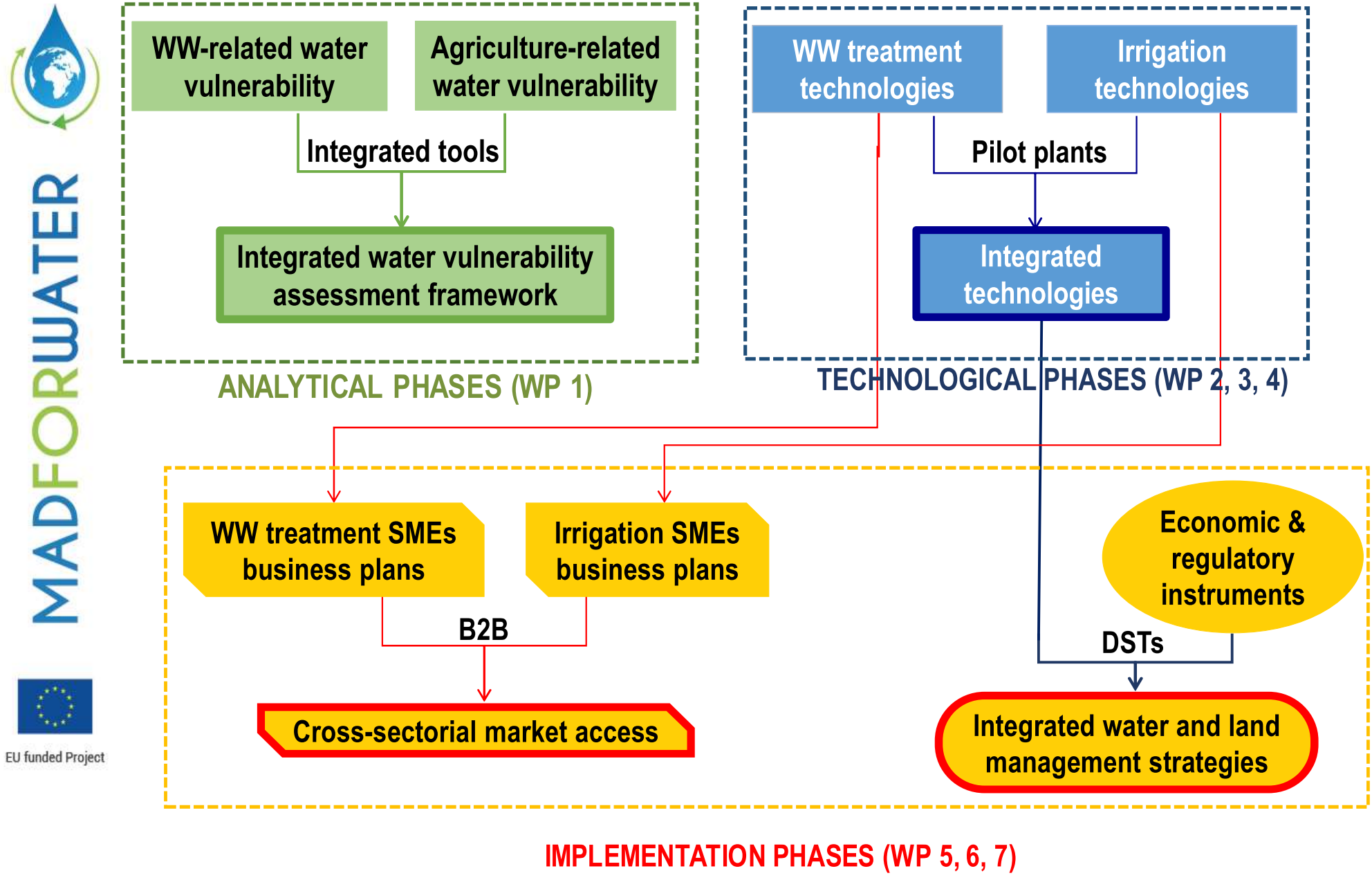
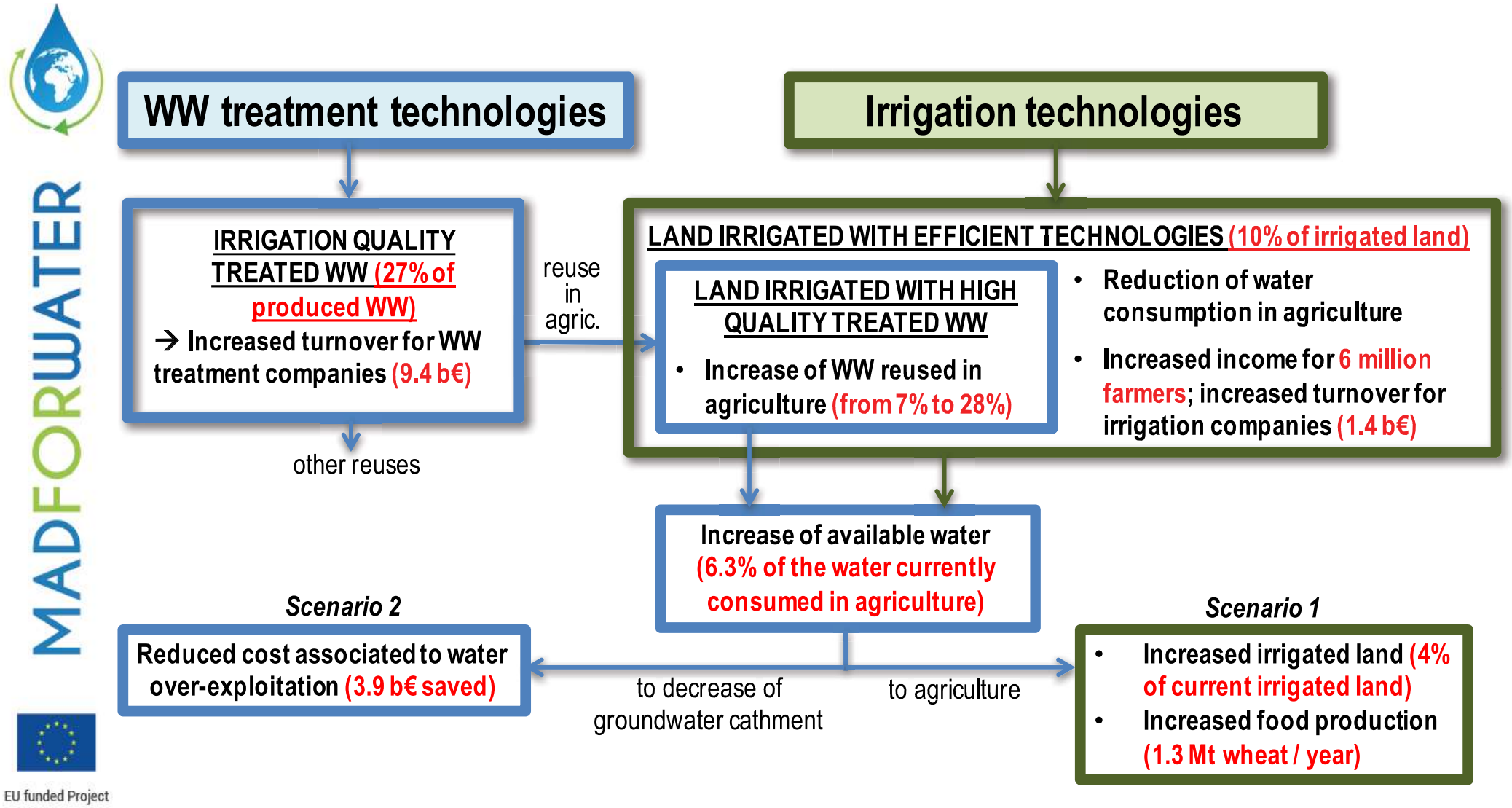


The Madforwater **integration strategy**



The expected impact



➢ *Estimated impacts referred to 10 years after the end of the project (2030)*

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DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries

Research and Innovation Action: Grant Agreement n° 688320

For more information on the project, visit www.madforwater.eu or contact us:

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Exploitation & communication: Marijn Mulder, marijn.mulder@pnoconsultants.com

ANNEX 6: MADFORWATER Newsletter

MADFORWATER

DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries

www.madforwater.eu

Dear Reader,

welcome to the first newsletter of MADFORWATER, an Horizon 2020 Research and Innovation Action project financed under topic WATER-5c-2015 "Development of water supply and sanitation technology, systems and tools, and/or methodologies". The general goal of MADFORWATER is to develop a set of integrated technological and management solutions to enhance wastewater treatment, treated water reuse for irrigation and water efficiency in agriculture in Egypt, Morocco and Tunisia. MADFORWATER will focus on municipal, agro-industrial and industrial wastewaters, as well as on the drainage canal waters of the Nile Delta. The development and validation of technologies will be combined to the definition of integrated water management strategies, tailored to the local context of selected hydrological basins in Egypt, Morocco and Tunisia. MADFORWATER, started on June 1 2016, has reached its 12th month of activity.

In this newsletter you will find:

1. an update on the MADFORWATER activities (p. 2)
2. a list of the conferences where MADFORWATER has been or will be presented (p. 10)
3. a description of our consortium (p. 13)

Enjoy the reading! And if you would like to receive further information or to set up collaborations, feel free to contact us:

Coordinator: Dario Frascari (dario.frascari@unibo.it)

Co-coordinator: Giulio Zanaroli (giulio.zanaroli@unibo.it)

Dissemination contact: Valentina Cinti (V.Cinti@ciaotech.com)

Web site: www.madforwater.eu

Water and water-related vulnerabilities in Egypt, Morocco and Tunisia

Wageningen Research is responsible for the assessment of water vulnerability in Egypt, Morocco and Tunisia. The entity and the causes of water stress and water vulnerability in Egypt, Morocco and Tunisia are analyzed, with specific focus on waste water treatment, water reuse and water efficiency in agriculture and their consequences on food security, sustainable agriculture, socio-economic growth and environment protection. In WP1, a country-level analysis will be integrated by more specific evaluations applied to the 3 target basins/sub-basins.

A first task is the analysis of current international cooperation agreements and their implications on the water-related goals in Egypt, Morocco and Tunisia. This task examines current international cooperation activities and international agreements in which the 3 target countries are involved in the field of water resources management at different levels: global initiatives, such as United Nations; Euro-Mediterranean, such as the Union for the Mediterranean; and agreements with neighboring African countries. The output of this task will be used in the following task for the identification of water vulnerabilities associated to lacks of international cooperation.

The second task is about analyzing and mapping water stress, water vulnerability and potential for water reuse in Egypt, Morocco and Tunisia. The analysis is performed at national scale for the countries with specific focus on waste water treatment, water reuse and water efficiency in agriculture. The elements gathered from the evaluation of water stress and vulnerability are used to evaluate the potential for treated waste water reuse in each basin of the target countries. This tasks is articulated into 5 steps:

- Definition of water vulnerability indicators
- Data collection on water stress and vulnerability originating from various sources
- Elaboration of water stress and water vulnerability maps in each country, focusing on water availability, water demand, main water constraints, integral water-land system
- Forecasting maps: 20 year projection of water stress and vulnerability based on different climate change and socio-economic scenarios
- Identification of business opportunities

The third task in WP1 is about Analysis and mapping of water stress effects on food security and socio-economic development in Egypt, Morocco and Tunisia. The effects of the identified water stress and vulnerabilities on different dimensions of food security and socio-economic development are addressed and analyzed through the Driving forces, Pressures, States, Impacts, Responses (DPSIR) framework. The analysis, performed in the 3 target countries at country scale, will lead for each country to the production of a report and of two food security risk maps, referred to the current situation and to a 20-year projection.

The last task is to evaluate in detail water stress and water vulnerability for the three selected basins, to explore strategies for non-conventional water use. The analysis in this task is divided into two steps:

- Development of a regionally adapted water vulnerability assessment framework, based on the DPSIR approach and including the identification of a limited number of water vulnerability indicators
- Identification of the obstacles towards the overcoming of the identified water vulnerabilities and stresses. The examined obstacles will include the following aspects: environmental (e.g. surface water and groundwater low per-capita availability and/or poor quality in the region), technical (quality of treated wastewater, availability of qualified technicians and of efficient waste water treatment plants (WWTP), law requirements for water discharge and reuse, availability of a reliable power supply, proximity of agricultural areas to WWTPs), economical (investment by public and private actors) and societal (perception of treated WW reuse for agriculture).

Adaptation of wastewater treatment technologies for agricultural reuse

MADFORWATER is developing and adapting to the local context of Tunisia, Morocco and Egypt, technologies for the treatment of municipal WW (MWW), textile WW (TWW), agro-industrial WWs, in particular olive mill WW (OMWW) and fruit and vegetable packaging WW (FVPWW), and drainage canal water (DCW) of the Nile Delta (Egypt), with the aim to produce irrigation-quality water.

Eleven WW treatment technologies have been selected for a first, laboratory-scale screening of potential solutions and treatment trains specific for the different WW types (Fig. 1). Energy requirements and/or capital and maintenance costs have been considered in the selection of technologies, bearing in mind that these are the main bottlenecks related to the water technologies utilized in the 3 target MACs. Most of the MADFORWATER WW-treatment technologies are existing marketable technologies currently poorly or not at all applied in MACs, for which innovative features are under development in order to adapt them to the local MAC context and to the production of irrigation-quality water, whereas a few are still at an early stage of development. The proposed technologies are under investigation at laboratory pre-pilot scale units (5-10 L), under conditions (e.g., temperature, solar radiation, etc.) closely mimicking those of the target countries, using synthetic or real wastewater (or drainage water) sampled in the following sites within the 3 target MACs: Manzala Pilot Area, North Eastern Egypt (DCW); Drarga, Agadir, Morocco (MWW); Tiznit, Agadir, Morocco (MWW); University of Manouba, Biotechnology Building, Tunis, Tunisia (MWW); Taroudant, Morocco (FVPWW); Mnihla, Tunisia (OMWW); Nabeul, Tunisia (TWW).

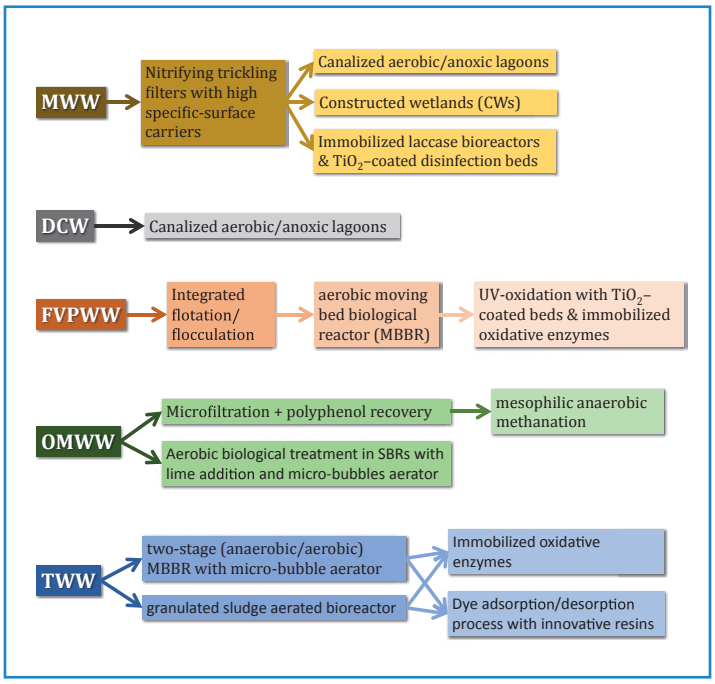


Fig. 1 - Potential treatment trains for each WW type

The following selected technologies are under investigation:

WW treatment technology 1: Canalized lagoon with nitrification/denitrification and disinfection capacity, for the tertiary treatment of municipal WW and for the treatment of drainage canal water. Canalized facultative lagoons are characterized by the alternation of aerobic and anoxic zones, that make them suitable for nitrification / denitrification processes and biological removal of BOD and phosphorous. In North African countries, thanks to the strong solar radiation, they can also perform a very effective disinfection. They can also be used as reservoirs, to store irrigation water to be used during dry seasons. In the Egyptian context, the goal of MADFORWATER is to optimize the use of the existing drainage canals receiving drainage water and local WWs as canalized facultative lagoons, through proper modifications in terms of geometry and fluid dynamics.

WW treatment technology 2: Nitrifying trickling filters filled with innovative high specific-surface carriers, for the secondary treatment of municipal WW. In case of medium and small communities, trickling filters can represent an interesting alternative to activated sludge plants, thanks to the small or null energy consumption required for WW aeration. While traditional trickling filters are characterized by high retention times and poor nitrification/denitrification performances, MADFORWATER is developing filters characterized by innovative high-surface carriers so as (i) to reduce retention times thanks to the attainment of a high biofilm thickness, and (ii) to improve the nitrification/denitrification performances.

WW treatment technology 3: Constructed wetlands with plant growth promoting bacteria, for the tertiary treatment of municipal WW. Constructed wetlands have the potential to remove priority pollutants, nitrogen, phosphorous, heavy metals and residual BOD, thanks to the combined effect of plants and of the rhyzosphere's microbial community. The coexistence of anoxic–aerobic–anaerobic microenvironments favours different removal mechanisms. Plant growth promoting bacteria can play a key role in constructed wetlands by actively cooperating with plants in the degradation process.

WW treatment technology 4: Enzymatic degradation of emerging pollutants, dyes and fungicides with immobilized laccases, for the tertiary treatment of MWW, TWW and FVPWW. Immobilized oxidative enzymes such as laccases are of particular interest for dyes removal from TWW, fungicide removal from FVPWW and micropollutants removal from MWW, because of their extreme selectivity in comparison to other advanced oxidation processes or adsorption. Laccases do not require co-factors, and robustness and reusability of immobilized laccases are demonstrated. They can be produced with simple and cheap fermentation technologies (e.g. solid state fermentation), possibly using cheap agroindustrial residues locally available. Immobilization does not require enzyme purification and is simple, fast and

reproducible. Costs of the WW treatment process may also be reduced by considering packed bed systems rather than membrane bioreactors.

WW treatment technology 5: Catalytic disinfection beds activated by solar UV light, for the treatment of municipal WW. WW disinfection by means of UV-activated catalytic beds is a low-cost, low-environmental impact effective alternative to conventional disinfection systems. They are well adapted to the local conditions of the North African context, where high solar radiation intensity is present. During night time the effluents can be stored in a holding tank and treated during daytime. WW treatment technology 6: Flotation/flocculation integrated process, for the treatment of FVPWW. Flotation represents an interesting alternative to sedimentation, thanks to the reduced treatment volumes and to the increased treatment efficiency. The combined flotation/flocculation process proposed by MADFORWATER allows the attainment of high removal efficiencies not only for suspended solids but also for BOD. It is characterized by a very low HRT (3-4 minutes), a low recycle ratio and a low energetic consumption.

WW treatment technology 7: Membrane filtration + phenolic compounds adsorption with selective resins + anaerobic digestion in biofilm reactor, for the treatment of olive mill WW. Although several types of processes have been proposed in the literature to treat olive mill WW, none of them has been scaled-up to real-scale low-cost applications, so far. The treatment train proposed by MADFORWATER is close to industrial application. It can produce a final effluent suitable for irrigation, and each step leads to a specific OMWW valorisation: olive paté from filtration, polyphenol-rich mixtures with high anti-oxidant properties from adsorption/desorption, electricity and heating from anaerobic digestion. Adsorption/desorption will be characterized by the complete recycling of the desorption solvent. Anaerobic digestion can be performed in possible co-digestion and/or alternation with other wastes typical of the North African context.

WW treatment technology 8: Aerobic sequenced batch reactor (SBR) with lime addition, for the treatment of olive mill WW. The SBR process presents several potential advantages in comparison to traditional aerobic processes. The implementation of an aerobic SBR process for the treatment of OMWW is of particular interest, on the basis of the pilot-scale studies performed by MADFORWATER partners. To minimize the energetic consumption associated to oxygenation, a novel high-efficiency air distribution system based on the production of micro-bubbles will be implemented in this SBR process.

WW treatment technology 9: Granulated sludge bioreactor, for the treatment of textile WW. Aerobic granulated sludge was proposed in recent years as a compact, robust and low energy consuming WW secondary treatment technology for industrial effluents. MADFORWATER addresses the potential weaknesses of granulated sludge aerated bioreactors, by developing stable consortia adapted to the treatment of real textile WW, and by investigating the mechanisms of granular sludge formation and the factors ensuring its stability.

WW treatment technology 10: Moving Bed Biological Reactor, for the treatment of textile WW.

The Moving Bed Biological Reactor (MBBR) is finding increasing applications at industrial scale, for the treatment of high-load WWs. Its application to the treatment of textile WW is innovative, and could potentially lead to a significant reduction of the treatment costs. A two-stage (anaerobic/aerobic) MBBR with the aerobic step aerated by a novel oxygenator of Nanotera Group is under developement.

WW treatment technology 11: Textile WW treatment by adsorption with innovative resins.

The proposed adsorption/desorption process aims at the removal of aromatic amines, brown color and metals. Magnetic polyacrylic microspheres previously developed by the Chinese MADFORWATER partner will be adapted, by modifying pore size and functional groups. An online UV/Fluorescence sensor, designed to monitor aromatic amines and chromophores, will be integrated into the system as a feedback signal, to achieve an automatic optimization of operational parameters. The possibility to re-utilize the desorbed material in the textile industry will be evaluated. The performances will be compared with those obtained with advanced oxidation processes (electrolytic treatment with Boron-doped diamond electrodes), taken as a benchmark technology.

For each technology, the operational conditions (such as hydraulic residence time (HRT), organic loading rate (OLR), recycle ratio were applicable) characterized by the best removal efficiency and rate with regard to the main pollutants of each tested WW will be identified. Effluent quality will be evaluated on the basis of international standards for WW reuse in agriculture. The technologies for municipal WW and drainage water treatment will be also assessed in terms of disinfection efficiency. Life Cycle Analysis (LCA) and Cost Benefit Analysis (CBA) of the technologies will be finally carried out to assess and improve their environmental performance and to evaluate them in terms of projected costs and turnover. The results of these activities will provide the elements for the selection and scale-up of the technologies that will be further tested and adapted in field pilots that will be constructed and operated in the target MACs.

Adaptation of technologies for efficient water management and treated wastewater reuse in agriculture

WP 3 focuses on innovative solutions for an efficient treated wastewater reuse in agriculture adapted to Mediterranean context. During the first year project, investigation about several approaches and technologies was started and activities were carried out in the field of: Plant Growth Promoting (PGP) bacteria to enhance crop resistance to water stress and salinity; generation of tensiometers suitable for high-salinity treated wastewater; modeling tool for optimal irrigation scheduling with different water types; development of low-pressure mini-sprinkler and calibrated nozzles for localized irrigation for the modernization of traditional surface irrigation; development of integrated physical and economic model for land and water optimization. Finally, an LCA and CBA of the tested wastewater reuse technologies have been initiated.

Marocco and Tunisia, in collaboration with the International Center for Advanced Mediterranean Agronomic Studies (IAMB) and Università degli studi di Milano (UMIL), have carried out experiment trials to investigate the effect of Plant-Growth Promoting (PGP) bacteria strains on growth and yield of different crops. Bacteria were isolated using different types of cultivation media well-adapted to drought condition. Several samples of soil and organic matter were collected from Argan and olive trees in Marocco and 400 bacteria were isolated. In Tunisia, a collection of bacterial strains was obtained from the root system of olive (100 isolates), citrus (50 isolates) and fig trees (40 isolates) currently irrigated with treated waste water. Besides, 80 endophytic bacteria were isolated from *Medicago* spp., while 500 strains have been established from *Sorghum* irrigated with treated waste water. In detail, a genotyping and identification were done by means of 16S rRNA gene sequencing on *Argania spinosa* isolates and on a subset of the *Sorghum* isolates to select bacterial strains for further cultivar. Moreover, eight Plant-Growth Promoting (PGP) bacteria, previously isolated at UMIL lab from extremophilic plants such as *Salicornia* sp., have been tested under greenhouse conditions using tomato as reference plant and artificially inducing water stress. So far, positive results have only been observed in the middle of the growing season (increased growth of the inoculated plants compared to non-inoculated control) for some bacteria. For this reason, a further greenhouse experiment is carried out at IAMB to investigate the benefits of bacterial on whole growing cycle of tomato. Five bacterial strains were selected based on their positive effects on survival and/or growth of some drought tolerant plants (e.g. salicornia, mangrove, resurrection plant) cultivated in the countries involved in the project. Bacteria were isolated and identified to exclude pathogens. After seedbed preparation at IAMB, seedlings were transplanted into pots filled with sampled soil at IAMB experimental fields, while the strains of bacteria were inoculated into the soil one week later. Potted tomato plants are grown under three different water regimes, aiming to investigate whether PGP bacteria be reduced the amount of water supplied and increase crop water use efficiency (yield/water applied) of tomato. Soil and crops parameters, and greenhouse micro-climate are monitored during the growing season of the tomato crop.

As for the generation of tensiometers suitable for high-salinity treated wastewater, the work has focused on the selection of the best compromise in terms of material (porous media) to be used and on the development of a testing bench. This bench will be used to check the performance of tensiometers in the production line.

A preliminary version of the software for the optimal irrigation scheduling with different water types and the related manual have been prepared while the module on fertilization management is still in progress.

As for the low-pressure mini-sprinkler, a set of droplet sizing tests have been performed to determine droplet size range according to the type of emitters. Calibrated nozzles for localized irrigation prototypes have been produced and tested for anti-leakage capacity. They are effective around 0.4bar pressure. Numerical modeling of flow and fluid interaction with membrane are being studied. Experimental field to test technologies for modernization and increased efficiency of traditional surface has been equipped in Egypt.

Integrated optimization model related activities started with the collection of economic data in the selected case studies areas: greenhouses and citrus farming system in the Souss and Chtouka Ait Baha Areas of the Souss Massa River Basin (Morocco) and the irrigated farming system in the Kafr-El- Shiekh Region (Egypt).

Finally, a joint questionnaire on LCA-CBA was prepared and send to every partner; analysis of results and compilation of qualitative elements in a report. An inventory of qualitative elements for CBA was performed and finalized.

Life Cycle Assessment (LCA) & Cost Benefit Analysis (CBA)

Life-cycle assessments (LCA) will quantify potential environmental impacts and benefits of Mad4water technologies at early stage. It will be conducted for the wastewater treatment and irrigation technologies following the well-established phases: goal definition & scoping, life cycle inventory, impact assessment and interpretation, as shown in Figure 1 below.

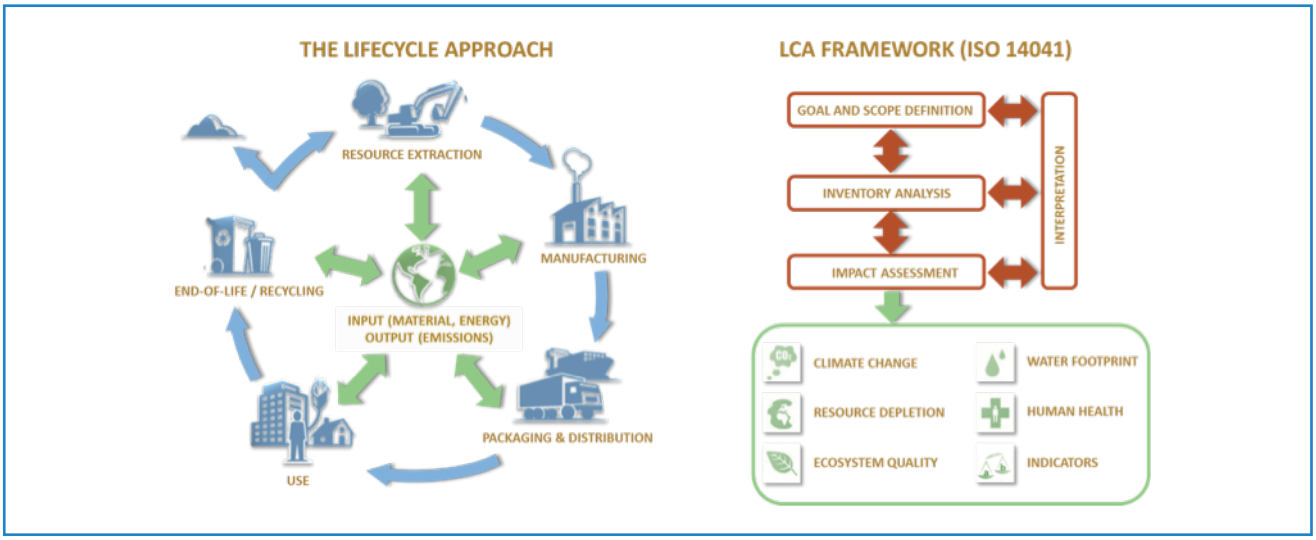


Fig. 2 - Life-cycle assessments (LCA) approach, framework and impact categories.

LCA at an early stage of technology development faces several challenges, as the inventory will be based on technologies still under development and processes might not be well-defined yet. However, an early stage LCA can also directly foster and support the improvement of the environmental performance of the developed technologies by identifying main processes contributing to environmental impacts and help optimize those. As many data estimations will be required for the inventory, the LCA methodology will be streamlined in order to provide relevant information for possible optimization of the technologies' environmental impacts and demonstrate the environmental benefits of the implementation of the developed technologies compared with current situations. University of Applied Sciences and Arts Northwestern Switzerland (FHNW) will conduct the analysis using state-of-the-art software and database. The LCA based on the results of the lab-scale development of the WW treatment technologies, will be updated at a later stage, taking into account the performances of the field pilots.

Cost Benefit Analysis (CBA) will quantify the economic costs and benefits of MADFORWATER technologies at an early stage. CBA is a systematic estimation of all relevant costs and benefits. Evaluation of the developed technologies in terms of projected costs and turnover will be carried out by means of a Cost Benefit Analysis (CBA). In line with the LCA, CBA at an early stage of technology development faces several challenges, as the analysis is based on technologies still under development and processes might not be well-defined yet.

The CBA will be performed in three main steps. In the first step, the framework of the CBA dataset is determined. Most important part of this step is the identification of costs and benefits related to each technology. Examples of costs are: capital, operating, maintenance and additional costs, such as training and overheads, social/environmental costs imposed on third parties by each wastewater treatment technology, such as noise or carbon impacts. Examples of benefits are: health benefits related to irrigation with treated instead of untreated WW, or environmental benefits related to a decreased catchment of freshwater from water bodies. Other part of this step are (1) determining the base case; (2) identifying the planning period for the appraisal of a technology; and (5) determination of a discount rate to convert future values into present values.

In a second step, the costs and benefits of each MADFORWATER technology is quantified. In our to come to a good estimation of the costs and benefits each partner working on a technology will be guided by PNO Innovatieadvies BV (PNO) and Università di Bologna (UNIBO) in the quantification of the elements required for the CBA analysis of each technology, with reference to a standardized size of the WW treatment facility. All costs and benefits will eventually be discounted by using an appropriate discount rate and time horizon.

The final step of the CBA is the economical evaluation and comparison of the different technologies through the application of the CBA model. In addition to making the calculations and comparisons, a sanity check and a sensitivity analysis is performed to ensure the validity of the CBA-model.

At this point, qualitative information regarding the relevant costs and benefits has been collected for the MADFORWATER technologies. PNO is currently developing the computational framework for the CBA and conducting preliminary analysis for some of the technologies that have quantitative information available. In the end, quantitative data will be collected for all technologies and used to provide insight into their economic performance.

Field pilots for the adaptation and integration of technologies

In the 3rd and 4th year of MADFORWATER, selected wastewater treatment and irrigation/water reuse technologies will be the object of pilot-scale experimental testing and demonstration to be performed in selected sites in Egypt, Morocco and Tunisia, so as to improve their adaptation to the local context. Four pilots of integrated wastewater treatment and water reuse/saving in agriculture will be set up, one for each type of studied WW (municipal, drainage canal, agro-industrial, industrial). A SWOT analysis will be implemented in order to select the sites for the four pilots and the technologies to be implemented in each pilot, on the basis of scores assigned to each technology in relation to (i) their technical performances, (ii) their social and technical suitability in relation to the local context and (iii) the outcome of the life cycle assessment and cost-benefit analysis. Each pilot plant will consist in a wastewater treatment section and an irrigation section, where typical crops of the three target countries will be grown. Each plant will be monitored for at least one year.

Integrated water and land management strategies for wastewater and agricultural water management

From technologies to integrated water and land management strategies

MADFORWATER develops and applies several wastewater treatment, water management and irrigation technologies for agricultural reuse, aiming to contribute to efficient water management in Mediterranean African Countries. After demonstrating that the selected technologies can efficiently be adapted to the local conditions, integrated technological and management strategies will be proposed for selected case study river basins in Egypt, Morocco and Tunisia accompanied by the development and application of relevant decision support tools. For example, a typical strategy can include the implementation of an additional wastewater treatment technology to the wastewater effluent of a specific industry in order to attain irrigation quality water to be reused with efficient irrigation technologies suitable to the local conditions.

However, although technological innovation is part of the solution, it is not enough to deal with current and future challenges of water management. The UN Sustainable Development Goals and the Mediterranean Strategy for Sustainable Development emphasise the need to attain sustainable use and management of water resources, which requires stabilising water demands, improving water use efficiency, and enhancing participation and cooperation across sectors and scales. For this, international and national initiatives are concentrated on establishing Integrated Water Resources Management (IWRM) policies and promoting water demand management, including the use of appropriate economic instruments for water management. Such instruments encourage technical and economic efficiency of water use and incentivise the adoption of new technologies and innovative solutions. However, the level of implementation of such approaches in Mediterranean countries varies largely. The diversity of natural, socio-economic and institutional landscapes across Southern and Eastern Mediterranean countries determines different needs and obstacles for water management.

Strategies and economic instruments for basin-scale water resources management

The MADFORWATER project will develop new water and land management strategies. For this, it will build upon the review and assessment of current water management approaches and policies and the use of economic instruments in the three selected case studies in Egypt, Morocco and Tunisia. The elaboration of these water and land management strategies will include the development of Decision Support Tools (DSTs) aimed at integrating the bio-physical and socio-economic dimensions of water use, and the implementation of MADFORWATER technologies at basin-level. Further, economic and regulatory instruments will be identified to enhance the effective implementation of the selected technologies.

Evaluation of the strategies according to local conditions and priorities

Even if certain technologies and management solutions might prove to be efficient on a technical basis, challenges for practical implementation especially in the context of emerging economies are often overwhelming. Such challenges often include the lack of sustainable funding schemes and the required inter-sectoral coordination within river basins.

For this reason each proposed strategy will be evaluated in different ways, including Stakeholder Consultation Workshops, so as to receive feedback from local stakeholders on the technical and social suitability in relation to the local context. A comprehensive evaluation will be performed on how each strategy can potentially reduce the vulnerability to water stress in riverbasins and improve the adaptive capacity of local stakeholders to deal with water challenges, both under the current and expected future conditions considering climatic, policy and economic aspects.

Exploitation and promotion of the most effective strategies

In order to promote and foster the implementation of the developed strategies, exploitation plans will be developed as well as a catalogue of economic instruments, policy recommendations, capacity building activities and other locally-relevant measures.

Exploitation

MADFORWATER aims to tackle the integration of wastewater treatment and water reuse in agriculture to reduce water vulnerability in Egypt, Morocco and Tunisia. Having adopted a participatory and multidisciplinary approach, the consortium partners are strongly focused on realizing the expected impacts. At the end of the project, MADFORWATER will deliver several pilots, integrated water and land management strategies as well as related economic instruments. On the long term the project aims to achieve a number of environmental, social and economic impacts associated to WW treatment and the agricultural sector. Furthermore, MADFORWATER is expected to lead to a strengthened competitiveness and growth of EU and MAC companies.

Exploitation is often mentioned together with the activities of dissemination and communication. Whereas dissemination and communication predominantly aim at broadcasting the project's potential and creating engagement during a project's lifetime, exploitation focuses on creating a lasting impact. Suitable exploitations actions are therefore of great importance to achieve success. To maximize the realization of the impacts of MADFORWATER the partners have adopted a dedicated exploitation strategy which is based on two main pillars, being: a) management of the generated knowledge, and b) a set of actions to strengthen exploitation of the project's results.

The MADFORWATER project is expected to generate up to fourteen results during the project's lifetime, with the majority of results to be delivered in year 3 and 4 of the project. During the project implementation generated knowledge will be continuously monitored and managed, potentially resulting in the application of suitable protection tools and measures. Furthermore, each delivered result will be assessed on its exploitation potential, resulting in a clear view of benefits, user groups, competition and market, establishing an understanding of its market potential. Following these evaluations, appropriate exploitation strategies will be established. The exploitable results are supported with several tailored actions, including business plan development, capacity building workshops and training. In addition to MADFORWATER's exploitation activities a project-internal exploitation seminar is organized as part of the third project consortium meeting in Montpellier. The exploitation seminar will focus on standardization as a suitable mechanism for supporting market entry and will also cover the added value that the lean canvas business model offers in developing business strategies.

Capacity building activities

MADFORWATER will foster the capacity building of local actors in relation to the implementation of the selected technologies, strategies and policies, thanks to a consistent portfolio of training, knowledge transfer and increased social acceptance activities:

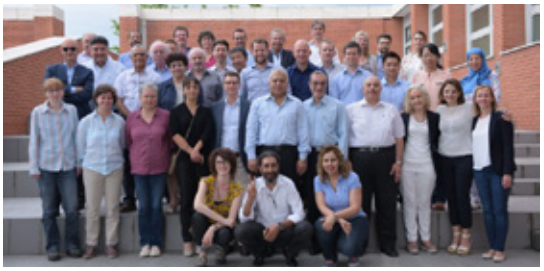
- **2 capacity building workshops (CBWs) on the project technologies, water management strategies and policies:** 1 CBW will be held in a selected MAC country in combination with a scientific conference, and will be directed to different SAB and non-SAB end-user groups such as farmers, water users, WW treatment technicians, WW producing industries; the other will be held in Brussels and will be aimed at informing EU water treatment and irrigation companies, WWTP managers and water authorities on the project outcomes;
- **1 train-the-trainer 5-day course on the irrigation/water reuse technologies and on the WW treatment technologies;** the course will be attended by 4/5 trainers from each target MAC;
- **4 on-field trainings (1 for each pilot plant)** addressed to WW technicians, managers, farmers and PhD students;

- **Post Graduate (MSc and PhD) and early career researcher exchanges between EU and MAC research institutions;**
- **Field visits to water user associations, pilot areas, WWTPs and agricultural areas with innovative irrigation technologies**, organized in parallel to the MAC capacity building workshop and train-the-trainer courses;
- **Promotion of water user associations** in order to increase the acceptance of the proposed solutions and to transfer knowledge for implementation;
- **Interviews and meetings with local water authorities and institutions**, to connect them with the knowledge generation process of the project and to inform them about the potentials and pit falls of the proposed strategies.

Previous Project Meetings

MADFORWATER Project Kick-off meeting

On June 15th and 16th 2016, the MADFORWATER Project consortium partners met in Bologna for the official kick-off meeting. Forty-five representatives of the eighteen partners participated to the meeting and discussed the work plan and timetable that will form the basis of the work that will be carried out in the next four years.



The last project meeting was held in Agadir, Morocco, to analyze the project activities implemented so far and plan the upcoming initiatives.

The next project meeting will be held in Montpellier (France), 3-5 July, where will also take place the exploitation strategy seminar.

M4W advisory board

The adaptation of the project's technologies and management solutions to the actual needs and local context of the target MAC countries represents a crucial aspect of MADFORWATER. To this goal, the project periodically consults an Advisory Board mainly constituted not only by representatives from EIP water, JPI water, UNEP, Water Supply and Sanitation TP and Spanish National Research Council, but also by relevant stakeholders active in the field of water treatment, management and reuse in Egypt, Morocco and Tunisia. These stakehodlers periodically provide feedbacks on the adaptation measures undertaken and the social acceptance of the proposed solutions, in order to minimize barriers to the actual implementation and exploitation of the MADFORWATER technologies and tools.

The first stakeholder consultation workshop took place on 16th December 2016 in Agadir, Morocco, and it focused on the adaptation approach of technologies and non-technological instruments (management , monitoring, training) and on the identification of barriers and drivers to promote the reuse of treated waste water for irrigation. 15 stakeholders from Morocco and 2 from Tunisia participated, in addition to scientists from several MADFORWATER partners. The workshop led to the identification of the following obstacles towards wastewater treatment and agricultural reuse in the 3 target countries: lack of political will to enable coordination and communication

between the institutions involved in the wastewater treatment; difficulty in identifying the institution that takes the responsibility for wastewater reutilization; lack of roles definition; lack of funds to finance wastewater treatment and monitoring of treated water quality; lack of clear legislation on the reuse of treated wastewater for irrigation. The stakeholders generally agreed that a transdisciplinary institution with a new mandate focused on treated wastewater reuse is needed to overcome the fragmentation of responsibility and to coordinate all existing institutions.

MADFORWATER has been presented at…

AfriAlliance CONFERENCE

The project participated in the AfriAlliance conference which took place in South Africa, from 22nd to 24th of March. The AfriAlliance Conference took two and a half days, coinciding with World Water Day. It presented the AfriAlliance Action Groups and their areas of focus; showcase African research, innovation, policy and capacity development initiatives that were looking for European partners and vice versa; and provided the opportunity to obtain inputs and suggestions for further shaping AfriAlliance's activities.

Marrakech COP22 CONFERENCE

In November 2016, the project was also presented in the Marrakech COP22 Conference, an yearly event included among one of the United Nations Climate Change Conferences, organized in the framework of the United Nations Framework Convention on Climate Change (UNFCCC). More in detail, Madforwater participated in the a European Commission side-event "Water-Energy-Food: research and innovation to address the nexus in the Mediterranean", aiming at bringing together institutional actors and research and innovation stakeholders to share insights into challenges and solutions for a low-carbon economy interlinked with sustainable management of resources. The discussion focused specifically on the nexus challenges in the Mediterranean region.

MARRAKECH
COP22ICMP12
UN CLIMATE CHANGE CONFERENCE
2016

252nd ACS National Meeting
organized by American Chemical Society
24 august 2016

GRICU - The 2020 horizons
of chemical engineering
13 September 2016 - Anacapri (Italy)

IWA Flotation Conference
Toulouse - 29 september 2016

1ST TUNISIAN-SOUTH AFRICAN
INTERNATIONAL WORKSHOP
4-7 November 2016 Tunisia

Water Global Expo
Ecomondo 2016 Fair
8 November 2016 - Rimini (Italy)

ICEST 2017
13 - 15 January 2017

WaterHeroes,
Center for Mediterranean Integration
21/22 March 2017 – Marseilles

Conference presentation in 7th
Mikrobiokosmos Conference 2017
7 - 9 April 2017 - Athens, Greece

Industry Water: From Single Use
to Integrated Management
20 April 2017 - Bruxelles

The EGU General Assembly 2017
22-28 April 2017 - Vienna, Austria

Attualità dell'Idraulica Agraria e delle Sistemazioni Idraulico-Forestali al cambiare dei tempi

Upcoming events where MADFORWATER will be presented

6th International Symposium
on Biosorption and
Biodegradation

Biobio2017. 25-29 June 2017,

9th International Conference on
Environmental Engineering and
Management

6 – 9 September 2017

Bologna, Italy

22nd Workshop on the
Developments in the Italian
PhD Research on Food Science,
Technology & Biotechnology.

September 20-22, 2017, LIBERA
UNIVERSITÀ DEGLI STUDI DI BOLZANO

14th International Phytotechnologies Conference

25 - 29 September 2017

Montréal, Canada

10th World Congress of Chemical Engineering.

1-5 October 2017,

Barcelona, Spain

ICIDC 2017, Internationa Commission on Irrigation and Drainage Conference

8-14 October 2017, Mexico

S2SMALL2017 IWA, Sustainable solution for small water and wastewater treatment systems

22-26 October 2017, Nantes, France

4th International Conference on Microbial Diversity 2017

October 24-26, 2017, Bari, Italy

Ecomondo 2017
Green & Circular Economy.

7-10 November 2017, Rimini, Italy

INTERNATIONAL SYMPOSIUM MICROBE-ASSISTED CROP PRODUCTION OPPORTUNITIES, CHALLENGES & NEEDS.

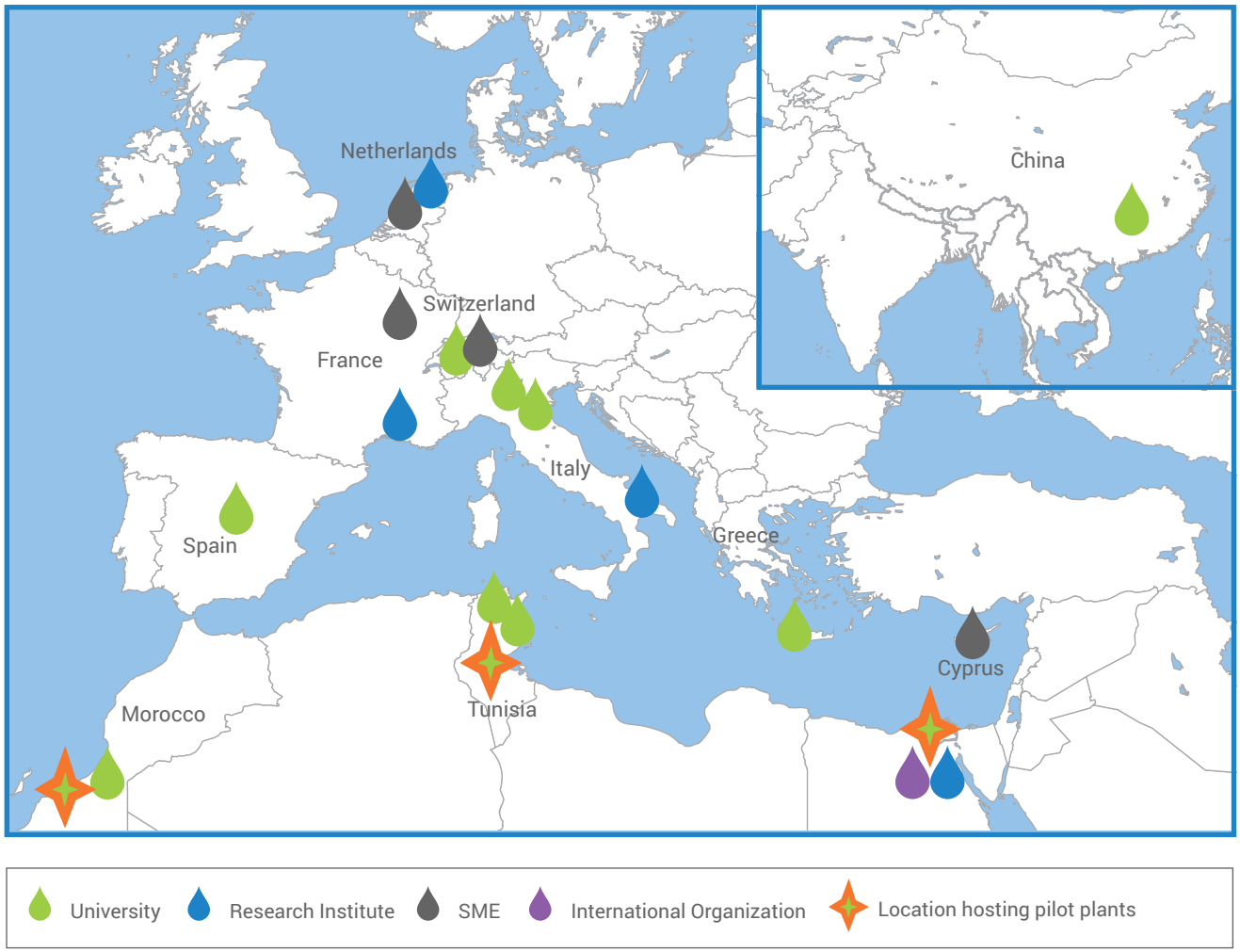
November 21 – 24, 2017 Vienna, Austria

VII Bioremediation Conference.

25-28 June 2018, Chania, Greece

The MADFORWATER consortium

The MADFORWATER consortium consists of 18 partners geographically distributed mainly around the Mediterranean Sea in 7 European countries, 3 MACs and China. It comprises 9 universities, 4 research centers, 1 international non-profit organization (FAO), 1 consultant and SME expert of marketing, business plan development and innovation management and 3 SMEs in the fields of WW treatment and irrigation. The MADFORWATER partners have a multi-disciplinary expertise that includes wastewater treatment, irrigation, life cycle analysis of technologies, cost benefit analysis of technologies, water vulnerability analysis, stakeholder involvement, integrated water management, capacity building, business plan development.



Università di Bologna
www.unibo.it/en

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Founded in 1088, the Alma Mater Studiorum – Università di Bologna (UNIBO) is known as the oldest University of the western world. Nowadays. UNIBO is the first Italian university in the international QS - World University Ranking of the world best universities since 2010 and the second Italian University in access to EU funding. The UNIBO research team in MADFORWATER includes the Bioreactors and chemical processes unit, the Biotechnology unit and the Wastewater treatment unit. These units, that have a long collaboration history, have expertise in the fields of chemical and biochemical process development and modelling, fluid-dynamic characterization of reactors, wastewater treatment processes, cost evaluation, microbial consortia characterization.

Technical University of Crete
www.tuc.gr

The School of Environmental Engineering of the Technical University of Crete (TUC) accepted its first students in October 1997 and quickly became a major centre of environmental engineering research in Greece. Despite the fact that the School is rather new, it has managed to acquire through National and University grants for fostering research and scholarship at the graduate level, all necessary laboratory equipment for undergraduate teaching and graduate research. BEEB Lab of TUC which is the partner in MADFORWATER brings in extensive experience in design and analysis of environmental processes, bioremediation of oil spills, ex-situ bioremediation, phytoremediation, wastewater treatment and in mathematical modelling. The team members are Nicolas Kalogerakis (PI), Danae Venieri (disinfection of treated municipal wastewater), Argyro Lakiotaki (textile wastewater treatment), Eleni Manousaki and Stavros Christofilopoulos (constructed wetlands for municipal wastewater treatment) and Margarita Petoussi (design guidelines).

University of Manouba
www.isbst.rnu.tn/eng

Higher Institute for Biotechnology Sidi Thabet (ISBST) founded in 2004 in the University of Manouba (UMA). Besides the education role, ISBST/UMA includes many research structures which develop the management and use of bioresources methods. The UMA research team in MADFORWATER (Laboratory of Biotechnology and Bio-Geo Resource Valorization) involve

(i) The microbial and molecular resources management for the development of biotechnological processes (use of microorganisms and active molecules) with particular attention to the field of plant growth promotion under abiotic stress, using in vitro, and in vivo applications.

ii) Development of relevant environmental biocontrol combining conventional pollution indicators such as bacteria and unconventional indicators such as enteric viruses and resistance to antibiotics using molecular tools.

University of Tunis El Manar
www.fst.rnu.tn/fr

The University of Tunis El Manar (UTM) was established in 1987 under the name "University of Science, Technology and Medicine of Tunis" and has had its current name in 2000. The UTM research team in MADFORWATER is member of laboratory of Microorganisms and active Biomolecules (LMBA) established since 2003 at the Faculty of Sciences of Tunis. The team is joining competencies of researchers working on water vulnerability, wastewater treatment and valorization and microbial ecology. The UTM team participated to several international projects financed by EU (FP7), NATO and and Bill & Melinda Gates Foundation (USA) in addition to bilateral and national projects.

Food and Agriculture Organization of the United Nations
www.fao.org/neareast

FAO is an agency of the United Nations that leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information, and helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all.

The Regional Office for Near East and North Africa, whose headquarters are located in Cairo, helps Member States work toward sustainable increases in agriculture production, minimize depletion and degradation of already scarce natural resources, boost rural development and reduce food loss and waste; the final objective being to achieve sustainable food security for all and to help vulnerable communities cope with and recover from shocks and crises. The Regional Initiative on Water Scarcity has been formulated to support the countries of the MENA Region to cope with one of their most striking challenges: the pursuit of food and water securities, for a sustainable social and economic development, under an unprecedented severe escalation of water scarcity. The objectives of the initiative are: enhancing policies, investments, governance and best practices to sustainably increase water and land productivity; providing tools for strategic planning of optimal and sustainable allocation of scarce water resources; implementing a regional collaborative strategy for a water-reform agenda.

FHNW
www.fhnw.ch

The core activities of the Institute for Ecopreneurship (IEC) at the School of Life Sciences (HLS) of the University of Applied Sciences Northwestern Switzerland (FHNW) include Environmental Technologies, Environmental Biotechnology and Sustainable Resources Management. It possesses lab facilities such as pilot-scale lab, trace analysis lab and radioisotope lab, which are all equipped with cutting-edge devices. The IEC research team in MADFORWATER covers the whole life cycle of technologies from proof of concept and assessment over implementation to monitoring and evaluation as well as the optimisation of production processes in terms of material and energy saving up to life cycle and risk assessment. Water frameworks and conclusive indicator systems play a crucial role in our daily work of assessments and evaluations in water management and technologies. The institute has extensive experience in leading and collaborating in large research projects and feasibility studies in developing countries in the water sector and adopted technologies.

S.K. EUROMARKET LTD

www.euromarket-cy.com

S.K. Euromarket Ltd (SKE), established in 1990, is a water and wastewater engineering company with almost three decades of experience in the design and construction of complete plants and equipment that cover a wide range of applications in the residential, municipal, industrial and agricultural sector. SKE is a reputable, highly competent, and professional engineering company with international operations in Europe, the Middle East and Africa and has a track record of over 300 successful water and wastewater projects to date. SKE has wide experience in its field guaranteeing successful and trouble-free application in a wide spectrum of operation. It's experienced and highly qualified engineering, scientific and technical personnel have completed more than six hundred varied projects. The SKE team in MADFORWATER includes Engineers (Mechanical and Chemical Engineers) with a long professional experience, excellent knowledge on the design and operation of conventional and advanced wastewater treatment processes, and Production technicians, qualified and trained in welding procedures, usage of production machineries and tools, responsible for the fabrication and assembly of equipment.

Universidad Politécnica de Madrid

www.upm.es

Universidad Politécnica de Madrid (UPM) (Technical University of Madrid) is Spain's largest technological university, placed first in the capture of external resources in a competitive regime and highly committed to innovation. The School of Agricultural, Food and Bio-systems Engineering, as part of the UPM, is a well-known institution for research in the fields of biotechnology, rural engineering, and agricultural economics (among others). UPM team, led by Professor Consuelo Varela-Ortega, has a long experience in socio-economic assessments in the agricultural sector with a special focus on farm level analysis, environmental impacts, resource efficiency, cost-effectiveness and the assessment of agricultural, environmental and natural resources policies, as well as climate change adaptation and mitigation, developed in several UE, national and international research projects. Modelling approaches and assessments performed include participatory techniques for the analysis of environmental measures at farm level (FP6 CROSS-COMPLIANCE), the linkages between agriculture and water resources (FP6 NEWATER and SCENES, FP7 MEDPRO), impacts and adaptation to climate change of agriculture and water resources (FP7 MEDIATION, H2020 MADFORWATER), the link between agriculture, biodiversity and climate change mitigation (FP7 ROBIN), and market analyses of traditional and novel high protein products (H2020 PROTEIN2FOOD).

Alterra

www.wageningenur.nl/en/Expertise-Services/Research-Institutes/Alterra.htm

Stichting Dienst Landbouwkundig Onderzoek (DLO Foundation) consists of a number of specialised institutes for applied research in the domain of living environment. DLO collaborates with one other legal entity – Wageningen University – under the external brand name Wageningen UR (University & Research centre). To realise this aim, the DLO Foundation operates through its research institutes, among which Alterra is involved in this proposal. DLO has a trong track record of multidisciplinary projects and is involved in hundreds of FP6 and FP7 projects and many other large national and international research projects. One of the strengths of Wageningen UR (including DLO) is that its structure facilitates and encourages close cooperation between the approximately 3000 experts from the University and various research institutes, which cover a wide range of expertise including food technology, plant, animal and economic sciences. Alterra belongs to the Environmental Science Group. Alterra employs 450 staff, combining expertise on green economy & biodiversity, soil, water & food security, spatial planning and ecology, and water resources and Climate Change. Alterra engages in strategic and applied research to support policy-making and management at the local, national and international level.

Institute of Agronomy & Veterinary Hassan II

www.iav.ac.ma

The Hassan II Institute of Agronomy and Veterinary Medicine (IAV) is a multidisciplinary polytechnic centre for biological and earth sciences and technologies based on an integrated system for high education, training and scientific research to serve agricultural and rural development. It's composed of several schools (Agronomy, Veterinary school, Agro-food industry, Horticulture, Topography, Rural engineering). The institute is offering engineering, veterinary medicine, master and PhD graduation diploma. More than 700 African students are graduated from IAV Hassan II. It does accounts 320 scientists and faculty members and 180 Technical staff – in 22 departments hosting different laboratories.

IAV scientists are involved in multidisciplinary international networks and collaborative research programs. In addition a large number of research-development projects are implemented in partnerships with European, African, and Mediterranean countries. Participation to the FPs (European programs) is a long tradition for the IAV. Currently, the number of projects involving IAV scientists is 51 from FP1 to FP6. Recently the IAV takes part in more than 13 projects in FP7 with 9 projects in FAB thematic (2011 EC statistics). Among those projects, IAV had a strong participation to MELIA project and actually is starting the Mediterranean INCONET Medspring. The IAV is also involved in national initiatives aiming to structure agricultural research and contribute to the Moroccan and regional development of agriculture. IAV Hassan II has profound expertise in water resources management under severe drought stress and intensive groundwater mining enabling the assessment of the multiple stressors on the economic, social, and environmental impacts of various water resources allocation alternatives at the overall river basin level. IAV is actively involved on integrated water resource management, particularly on the reuse of nonconventional water, and in the economic management model at the river basin scale.

International Center for Advanced Mediterranean Agronomic Studies
www.iamb.it

The Mediterranean Agronomic Institute of Bari (IAMB), established in 1962, is the Italian affiliate of the CIHEAM (Centre International d'Hautes Etudes Agronomiques Mediterraneennes), an inter-governmental institution founded under the auspices of the OECD and of the Council of Europe. The main activities of the Institute are advanced education, training, research, consulting and international cooperation in the domain of irrigated agriculture, integrated pest management, organic farming and sustainable agriculture development mainly in the Mediterranean Region. It promotes and coordinates cooperative research networks with a special focus on the application of new technologies (GIS, Remote Sensing and Modeling) in land and water management. CIHEAM-IAMB was and is involved in projects funded by World Bank, FAO, IFAD, EU, Italian Development Cooperation, German Cooperation. Acronyms of the most relevant and pertinent ones are listed hereafter: ACLIMAS; EcoWater; CLIMAWARE; MEDPRO; DIMAS; ICZM-Port Said; NOSTRUM-DSS; AQUASTRESS; WatNitMED; SCENES; PUER.

The CNR-Water Research Institute (CNR-IRSA) (linked CIHEAM-IAMB third part), plays a key role in the management and protection of water resources and in developing methodologies and technologies for water purification and treatment of wastewater. CNR-IRSA mainly operates through the development of Innovative Research on processes and methodologies related to environmental investigations; Pre-normative Research and Activities to provide institutional users with basic tools for interventions at technical and legislative level; Educational and training activities at different levels (scholarships, PhDs, post-graduate courses) for the growth of culture on water problems.

National research institute of science and technology for environment and agriculture
www.irstea.fr/en

IRSTEA focuses its research on water and environmental quality, risks, regional planning and sustainable development through environmental technologies. Its scientists are specialists in hydrology, geography, biology, chemistry, physics, computer sciences, economics, sociology, environmental sciences. The activities include experimentation, theoretical modeling and technical innovation. They contribute to appraisal and assessment consultancy projects to support public decision-making or carry out collaborative research with industrial companies. The PReSTI team involved in the project focusses its activity on irrigation tech,ologies and practices in an objective of improving efficiency of water use and durability of systems accounting for the quality of water or the environmental constraints.

PNO Innovatieadvies BV
pnoconsultants.com

The PNO Group, established in 1984, is Europe's largest independent Grants and Innovation Management advisory, providing support services to private and public organizations in innovation processes, technology transfer and funding for research, development & innovation. PNO is made up of a pool of around 250 professionals across 6 Member States including scientists, engineers, consultants, a Brussels policy advisory service, as well as financial and legal experts. For dissemination and communication activities, PNO has its own community building, management and dissemination tools, the core one being Innovation Place© (www.innovationplace.eu). PNO manages several open innovation Web portals (www.innovationplace.eu, www.smartransport.eu) serving over 8.000 high-tech companies and organizations in Europe. CIAOTECH S.r.l., a branch of PNO Group, will take part in the MADFORWATER project as a linked third party of PNO Innovatieadvies. CIAOTECH is specialized in Innovation Management, providing support services to private and public organisations in Product and Process Innovation, Technology Transfer, IT solutions and support for research and development projects.

Università degli Studi di Milano
eng.defens.unimi.it/ecm/home

The University of Milan is a public teaching and research university, which - with 8 faculties and 2 schools and a teaching staff of more than 2000 professors - is distinguished by its wide variety of disciplinary fields. A leading institute in Italy and Europe for scientific productivity, the University of Milan is the largest university in the region, with approximately 64,000 students. The UMIL research team in MADFORWATER is part of the environmental microbiology unit of the Department of Food, Environmental and Nutritional Sciences (DeFENS). The team is led by Dr. Sara Borin and includes microbiologists and molecular microbial ecologists with a strong expertise in extreme environments, such as arid lands and contaminated sites, and plant-microbe interactions potentially exploitable to sustain crop production and phytoremediation approaches.

National Water Research Center
www.nwrc-egypt.org

The National Water Research Center (NWRC) is the national institution devoted to water resources applied research in Egypt. NWRC was founded in 1975, as the research body within the Ministry of Water Resources and Irrigation (MWRI). NWRC consists of twelve specialized research institutes comprising the various water engineering disciplines. Besides, NWRC's attached facilities include: a Strategic Research Unit, a Central Laboratory for Environmental Quality Monitoring, a Geographic Information System, Information/ Documentation Center, and a highly specialized Central Library.. The NWRC research team in MADFORWATER includes the DRI team working in the Lake Manzala Research Station for the pilots of the project and the CLEQM team doing the chemical and biological analyses. Both groups have a long collaboration history in the National Water Quality Monitoring Network in Egypt and have expertise in the fields of civil engineering and chemical and biological analyses.

Nanjing University
www.nju.edu.cn/english

Founded in 1902, Nanjing University (NJU) is one of the oldest and most prestigious institutions of higher learning in China. Nanjing University is in the first group of a limited number of high-level research universities for prioritized support by the Central Government of China under the '985 Project.' According to different rankings and in terms of various indexes of academic strength and comprehensive academic performance, Nanjing University is always one of the leading universities in China.

The School of the Environment of Nanjing University has "State Key Laboratory of Pollution Control and Resource Reuse" (Coconstructed with Tongji University). The school has also undertaken numbers of national, provincial, ministerial, and local research projects. Tens of science and research achievements have passed the provincial or ministerial appraisals. Many of these achievements have won varieties of awards and prizes. In the MADFORWATER project, the NJU team led by Dr. Wentao Li and Dr. Yan Li are working on the development of smart water reuse technologies, including online water quality monitoring, advanced oxidation process, automatic control system and etc.

ROLLAND Arroseurs Sprinklers
www.rolland-sprinklers.com

Rolla is leader of the French irrigation sprinkler market. It is exporting in Europe (Belgium, Netherlands, United kingdom, Switzerland, Italy, Germany, Poland, Bulgaria, Romania), Africa (Tunisia, Morocco, Algeria, Senegal), Middle East (Egypt, Iraq) and Oceania (New Zealand, Australia), especially on fruit farming, garden farming, extensive cultivation and horticulture. Rolla also manufactures a full range of pop up sprinklers for green spaces, golf course, and stadium.

Thanks to our know-how, our engineering department assisted by the management and the sales department decided to join the MADEFORWATER program. It corresponds perfectly to our product development axes. All our technical capacities and with the support of our subcontractors we are working on this program.

KROFTA WATERS INTERNATIONAL
www.krofta.ch

KROFTA WATERS INTERNATIONAL (KWI), operates in the field of water treatment and has thousands of systems installed and operating in all regions of the world. Over the years, it is highly specialized in systems based on the principle of flotation known as"DAF" (Dissolved Air Flotation). Based on this principle, KROFTA offers four different types of plants to their own development and manufacturing MINICELL, SUPERCELL, SEDIFLOAT and SANDFLOAT presenting different mechanical and physical characteristics and process suitable for all types of primary and secondary treatment of industrial and municipal waste water as well as in the production of drinking water. The technology, developed by Dr. Milos Krofta in the 60 to recover the cellulose fibers discharged from the process of production of the paper, has been applied in paper mills around the world helping to create a real brand of efficiency and quality highly appreciated by all users. In over 50 years of presence on the market, KROFTA has designed and installed plants for the treatment of water in the following industries, paper, fish, milk and cheese, sugar and candy, metal industries, petroleum, textiles, tanneries, recycling of plastic, and much more.

For more info about the project visit the MADFORWATER website at: www.madforwater.eu

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MADFORWATER

تطبيق
الحلول
التكنولوجية
والإدارية المتكاملة
لمعالجة مياه الصرف
وإعادة استخدامها بكفاءة في
الزراعة مصممة خصيصا لتلبية
احتياجات البلدان الأفريقية من دول
البحر المتوسط.

www.madforwater.eu

القراء الأعزاء،

مرحباً بكم في العدد الأول لنشرة مشروع MADFORWATER الذي يتم في إطار برنامج البحث والابتكار أفق 2020 والممول تحت بند خطة المياه 2015-5c «تطوير أنظمة إمدادات المياه وتكنولوجيا الصرف والنظم والأدوات و / أو المنهجيات». ويتمثل الهدف العام من المشروع في تطوير حلول تكنولوجية وإدارية متكاملة لتعزيز عمليات معالجة المياه العادمة وإعادة استهلاك المياه المعالجة لأغراض الري وتحسين كفاءة المياه في مجال الزراعة في مصر والمغرب وتونس. هذا وسيركز المشروع على المياه العادمة على المستوى المحلي والصناعي الزراعي والصناعي، بالإضافة إلى مياه قنوات الصرف في دلتا النيل. إن تطوير هذه الحلول التكنولوجية وتطبيقها يقترن بتحديد الاستراتيجيات المتكاملة لإدارة المياه بما يتناسب مع الواقع المحلي في بعض الأحواض المائية المختارة في مصر والمغرب وتونس. بدأ المشروع في 1 يونيو/حزيران، وتم تنفيذ أنشطته طوال فترة عمره البالغة 12 شهرا.

تتضمن هذه النشرة:

- عرض لمشروع MADFORWATER
- قائمة بالمؤتمرات التي تم خلالها تقديم المشروع أو سيتم تقديمه.

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خلفية المشروع

تشكل إمدادات المياه المستدامة والمرافق الصحية ركنًا أساسيًا للأمن الغذائيّ والصحة والبقاء على قيد الحياة ورفاه المجتمع والنمو الاقتصادي للبلدان النامية وخاصةً الأفريقية منها. إن البلدان النامية عرضةً بشكل خاص للمشاكل المتعلقة بالمياه والتي من المتوقع أن تتفاقم في المستقبل جرّاء شدّة الفيضانات والجفاف وكثرة تواترها بسبب تغير المناخ.

تواجه منطقة الشرق الأوسط وشمال أفريقيا عواقب ندرة المياه وسوء نوعيتها. ومن المتوقع أن يزيد الطلب على المياه في المنطقة خلال الفترة بين 2015 و2035 بنسبة 47 في المئة بسبب النمو السكاني والاقتصادي، ومن ثم يتوقع المنتدى الاقتصادي العالمي تفاقم أزمة المياه بنسب كبيرة في السنوات العشرين أو الثلاثين القادمة.. إن البلدان المتوسطية الأفريقية في منطقة الشرق الأوسط وشمال إفريقيا هي الأكثر عرضةً للخطر لأنها تعاني بالأصل من مستويات عالية جدًا من نقص المياه، حيث تشكل الزراعة بين 80 و85٪ من استهلاك المياه العذبة. وبما أن الزراعة سريعة التأثر بتوفّر المياه ونوعيتها، ستتأثر هذه البلدان بشدة من جراء تفاقم أزمة المياه.

في ضوء هذه التحديات، أطلق الاتحاد الأوروبي في عام 2015 خطة المياه 2015-5c في إطار الدعوة للعمل على «تطوير إمدادات المياه وتكنولوجيا الصرف والنظم والأدوات و / أو المنهجيات» وذلك ضمن برنامج أفق 2020. إن الهدف من هذه الدعوة هو تحسين حالة الموارد المائية كماً ونوعاً، من خلال تطوير أنظمة إمدادات المياه والصرف وتطبيق الحلول الملائمة للظروف المحلية في البلدان المتوسطية الافريقية. ولأن أوروبا تعتبر من الروّاد في السوق العالمي في مجال الحلول المبتكرة المتعلقة بالمياه، فسيتم إستحداث فرص جديدة في الأسواق تساهم في النهوض بالاقتصاد في هذه البلدان

ويسعى مشروع MADFORWATER الذي يرتكز على البحوث والابتكارات إلى تحقيق أهداف خطة المياه2015-5c .

شرح مقتضب لمشروع MADFORWATER

يتطلع مشروع MADFORWATER إلى تحقيق أهداف الدعوة التي وجهها الاتحاد الأوروبي في إطار برنامج أفق 2020 للعمل على تحقيق خطة المياه 2015-5C، من خلال التركيز على تطوير الحلول التكنولوجية وغير التكنولوجية لإدارة الموارد المائية في تونس والمغرب ومصر. على مدى السنوات الأربع المقبلة، سيعمل الشركاء في مشروع MADFORWATER على تطوير الحلول التكنولوجية والإدارية المتعلقة بمعالجة مياه الصرف وإعادة استخدامها بكفاءة في الزراعة في شمال أفريقيا، بشكل يتناسب ويتوافق مع كل دولة على حدة. وبفضل هذه التكنولوجيات الجديدة المتقدمة التي سيتم ملاءمتها مع السياق الاجتماعي والتقني في الدول الثلاث المعنيّة، ستتمكن هذه الدول من إنتاج مياه صالحة للري إنطلاقًا من مياه الصرف المدنية والصناعية وكذلك من مياه قنوات الصرف. وفي موازاة ذلك، سيطوّر مشروع MADFORWATER تكنولوجيات جديدة تساعد على تحسين استعمال المياه وإعادة استخدامها في الزراعة. وسيساعد التعاون الوثيق مع الجهات الفاعلة وأصحاب المصالح المحليين في إيجاد الحلول وتنسيقها مع أخذ السياق المحلي بعين الاعتبار. من ناحية أخرى يهدف المشروع إلى إحداث تأثير إيجابيًا طويل المدى في مصر والمغرب وتونس، في مجال معالجة مياه الصرف وإعادة استخدامها، وبالتالي تحسين الإنتاج الزراعي والحد من استغلال احتياطيات المياه وتلوثها.

المشروع

أهدافه

يهدف مشروع MADFORWATER إلى وضع مجموعة من الحلول المتكاملة على الصعيد التكنولوجي والإداري لتعزيز معالجة مياه الصرف وإعادة استعمال مياه الصرف التي تمت معالجتها لأغراض الري، وتحسين كفاءة استخدام المياه في مجال الزراعة بهدف الحد من مشكلات نقص المياه في الأحواض المختارة في تونس والمغرب ومصر.

وسيتناول مشروع MADFORWATER في المقام الأول تكامل جانبيّ العرض (معالجة مياه الصرف) والطلب (إعادة استخدام المياه في الزراعة)، ومن ثم ملاءمة الحلول المقترحة مع السياق المحليّ من خلال:

- إنشاء أربع محطات تجريبية وتجهيزها بما يتناسب مع الواقع المحلي لمعالجة مياه الصرف وإعادة استخدامها بطريقة فعّالة في مجال الزراعة.
- اتباع نهج تشاركي ومتعدد التخصصات لتصميم الحلول على الصعيد التكنولوجي والإداري في إطار التعاون الدولي والتعاون الوثيق بين شركاء الاتحاد الأوروبي والبلدان المتوسطية والأفريقية؛
- حوار مستمر بين التحالف والعديد من البلدان المتوسطية الافريقية والجهات الفاعلة الدولية المعنية في المجلس الاستشاري للجهات الفاعلة، لتحقيق الملاءمة الأفضل للحلول المقترحة بما يتناسب مع السياق المحلي؛ وبالتالي تحقيق أعلى تأثير على المدى الطويل من تكنولوجيات مشروع MADFORWATER واستراتيجيات إدارة المياه وسياساتها.

مفهوم المشروع

يستند مفهوم مشروع MADFORWATER على التفاعل المستمر والمتآزر بين أربعة مجالات رئيسية هي: إمدادات المياه والطلب عليها والملامة والتكامل.

إن إمدادات المياه والطلب عليها هما النطاقان العاموديان أو ما يُعرف بمجالات العمل التي تخص تطوير الحلول التكنولوجية وغير التكنولوجية للحد من مشكلات نقص المياه وتأثير ندرة المياه على الزراعة، عن طريق زيادة كمية المياه المتاحة الصالحة للري (العرض) والتقليل من كمية المياه المستهلكة في الزراعة (الطلب).

إن عمليّتيّ الملاءمة والتكامل هما النطاقان الأفقيان أو ما يُعرف بالأعمال الشاملة التي تسمح بتعزيز التدخلات «العامودية» للمشروع بالعمل على ملاءمة نتائجها بحيث تتناسب من الناحية التقنية والثقافية مع السياق البيئي والاجتماعي والاقتصادي للبلدان المستهدفة (الملاءمة).

وعلاوة على ذلك، يتم تحسين النتائج ورفع قيمتها من خلال تحقيق التكامل بين الحلول التكنولوجية و الأدوات الاقتصادية والتنظيمية لكل نطاق عامودي ومن خلال التطبيق المشترك لحلول النطاقين العاموديين (التكامل). ومن خلال مجموعة شاملة من البحوث والابتكارات، سيقدم مشروع MADFORWATER حلول جديدة متطورة للحد من مشكلات نقص المياه على المدى الطويل في البلدان المتوسطية الافريقية المعنية.

خطة العمل

إن أنشطة مشروع MADFORWATER مُقسّمة إلى ثماني خطط عمل؛ أهم أهدافها ونشاطاتها ملخصة كما يلي:

خطة عمل 1: المياه ونقاط الضعف المتعلقة بالمياه في مصر والمغرب وتونس

تحليل وضع المياه ونقاط الضعف المتعلقة بالمياه في البلدان المتوسطية الافريقية على المستوى القطري بطريقة متكاملة من خلال تقييم نوعي وكمي يكون أكثر تعمقًا في الأحواض الثلاثة المعنية.

خطة عمل 2: ملاءمة تكنولوجيات معالجة مياه الصرف لإعادة استخدامها في الزراعة

تطوير التكنولوجيات وملاءمتها على مقياس مختبري لمعالجة مياه الصرف المحلية والزراعية-الصناعية والصناعية، حيث سيتم تكييف أحدى عشرة تكنولوجيا مع الظروف المحلية؛ كما سيتم فحصها وتقييمها من حيث الأداء وتقييم دورة الحياة والتكاليف والفوائد والقبول الاجتماعي في البلدان المستهدفة.

خطة عمل 3: ملاءمة التكنولوجيات لإدارة المياه بكفاءة وإعادة استخدام مياه الصرف المُعالجة في المجال الزراعي

تطوير التقنيات وملاءمتها على مقياس مختبري لإعادة استخدام المياه بكفاءة في الري. سيتم ملاءمة ست تكنولوجيات بما يتناسب مع الظروف المحلية؛ كما سيتم فحصها وتقييمها من حيث الأداء وتحليل دورة الحياة وتحليل التكاليف مقارنة بالفوائد والقبول المجتمعي في البلدان المستهدفة.

مخطة عمل 4: إختبار ميداني تجريبي لملاءمة التكنولوجيات وتطبيقها بشكل متكامل
اختيار التكنولوجيات وتطبيقها بشكل متكامل وتحديثها واختيار مواقع الاختبار الميداني التجريبي الخاصة بها. تصميم وانشاء ورصد وتحسين 4 اختبارات ميدانية تجريبية متكاملة لمعالجة مياه الصرف وإعادة استخدامها بكفاءة في مجال الزراعة.

خطة عمل 5: الاستراتيجيات والأدوات الاقتصادية لإدارة الموارد المائية في الأحواض
استعراض وتقييم الاستخدام الحالي للأدوات والسياسات الإقتصادية في مجال إدارة المياه في مصر والمغرب وتونس؛ تطوير أدوات دعم القرار المتاحة للجميع التي ستشمل الأدوات الاقتصادية والتنظيمية لتعزيز طرق تنفيذ التكنولوجيات MADFORWATER؛ وتطوير استراتيجيات إدارة مياه الصرف وإعادة استخدام المياه وكذلك، إدارة المياه والأراضي في المجال الزراعي. تم تصميم هذه الاستراتيجيات خصيصًا للأحواض الثلاثة المعينة.

خطة عمل 6: تطبيق استراتيجيات إدارة المياه والأراضي بشكل متكامل وتقييمها والتوصيات المتعلقة بالسياسات والاستغلال
وضع التوصيات المتعلقة بالسياسات لتشجيع اعتماد التكنولوجيات المقترحة والاستراتيجيات المتكاملة في البلدان المستهدفة؛ وضع مبادئ توجيهية تسمح بملامة أدوات وتكنولوجيات المشروع وتنفيذها؛ صياغة خطط الأعمال للاستغلال التجاري في البلدان المتوسطية الافريقية المستهدفة، فضلاً عن استراتيجية استغلال صناعية عامة، تستهدف قطاع المياه والري في أوروبا.

خطة عمل 7 : النشر والتواصل وبناء القدرات
وضع تدابير للنشر والتواصل والاستغلال وتنفيذها على أن ترتكز على بث إمكانات المشروع ورفع مستوى الوعي بين جميع أصحاب المصالح وضمان تأثير المشروع بعد انتهائه، بما في ذلك بناء القدرات وإشراك أصحاب المصالح.

خطة عمل 8: الإدارة والتنسيق
أنشطة الإدارة والتنسيق، بما في ذلك إدارة الشؤون الإدارية والمالية وإعداد التقارير.

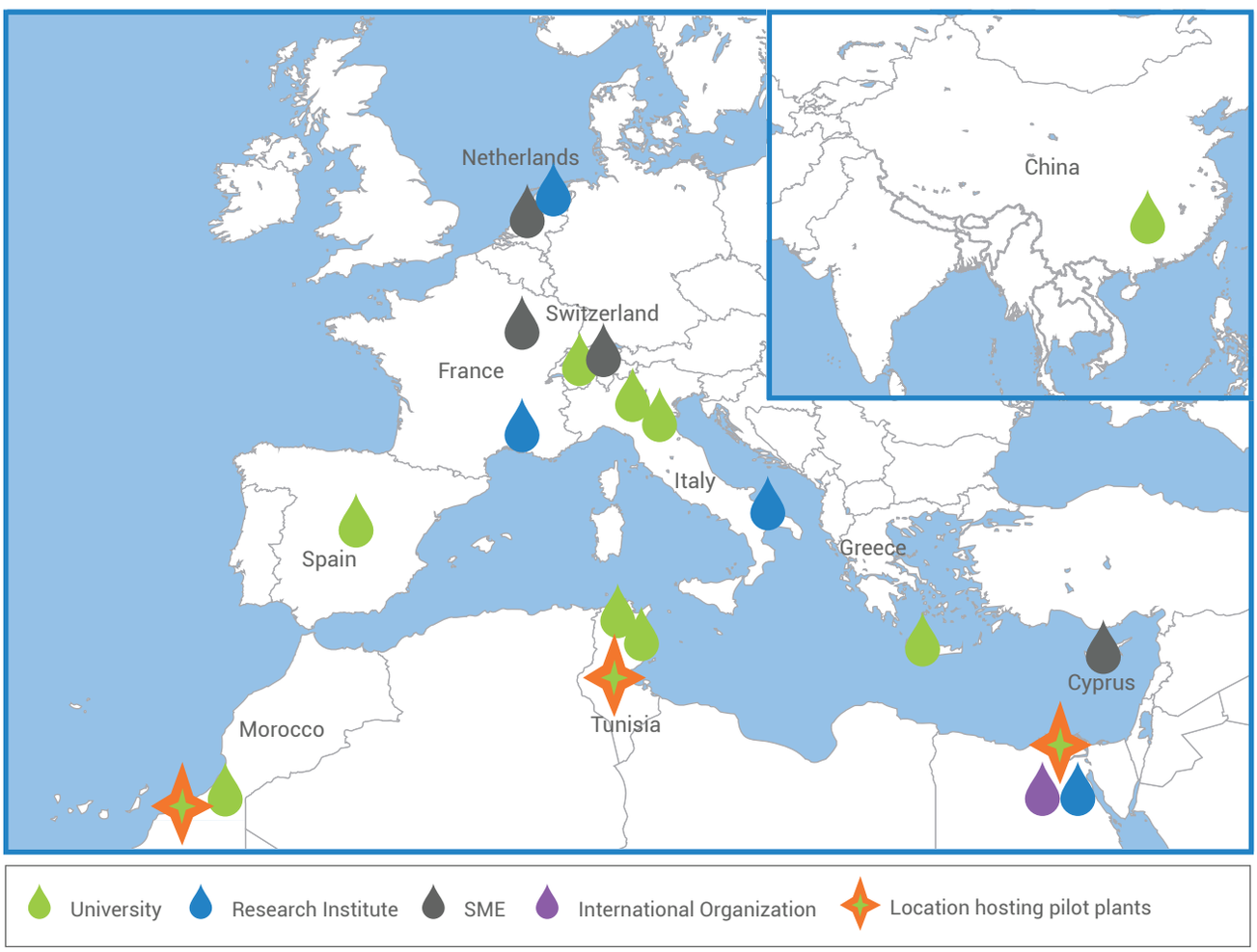
الفوائد

الفوائد والآثار الرئيسية لمشروع MADFORWATER :

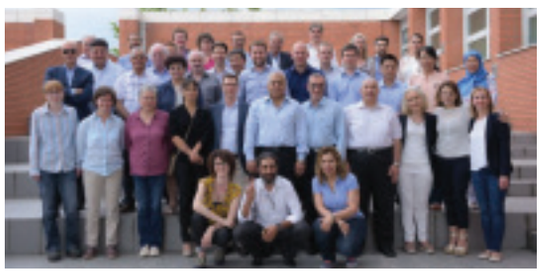
- سيقوم مشروع MADFORWATER باتباع النُهج وإرساء الحلول التقنية والابتكارية التي تؤدي على المدى الطويل إلى تدعيم معالجة مياه الصرف في مصر والمغرب وتونس. سيتم تجريب تقنيات المشروع والحلول في أربعة مواقع.
- سيوفر مشروع MADFORWATER الأدوات اللازمة لتحليل هشاشة أوضاع المياه بطريقة أفضل، وسيؤدي ذلك إلى تحديدٍ صحيحٍ للمناطق الأكثر عرضةً لمشاكل المياه والمناطق التي قد تسمح بإعادة استخدام مياه الصرف المُعالجة لأغراضٍ زراعيةٍ.
- سيطوّر مشروع MADFORWATER أدوات لدعم القرارات والأدوات الاقتصادية التي تؤدي إلى تطبيق عملي وفعّال لإدارة متكاملة للموارد المائية.
- سيدعم مشروع MADFORWATER بناء قدرات الجهات الفاعلة المحلية فيما يتعلق بتطبيق التقنيات والاستراتيجيات والسياسات المختارة، من خلال التدريب ونقل المعرفة وزيادة الأنشطة التي تعزز القبول الاجتماعي.
- سيزيد مشروع MADFORWATER من الرفاه الاقتصادي والاجتماعي في البلدان المتوسطية الأفريقية من خلال زيادة الإنتاج الزراعي وكذلك، من خلال النهوض بالأمن الغذائي والحد من تلوث الغذاء وخفض تكلفة معالجة مياه الصرف وزيادة الدخل وفرص العمل في مجال معالجة المياه وقطاع الزراعة في مصر والمغرب وتونس.
- سيدعم مشروع MADFORWATER تحقيق الأهداف المتفق عليها دوليًا والمتعلقة بالمياه في مصر والمغرب وتونس عن طريق زيادة استخدام مياه الصرف المُعالَجَة في مجال الزراعة والحد من استغلال مستجمعات المياه الجوفية وتنفيذ النُهج المتكاملة التي تُعنى بإدارة المياه على مستوى الحوض ومستوى البلد والحد من استهلاك الأسمدة وخفض استهلاك الطاقة ومن ثم انبعاثات ثاني أكسيد الكربون.
- سيزيد مشروع MADFORWATER من القدرة التنافسية والقدرة على اختراق السوق في البلدان المتوسطية الأفريقية من قبل قطاعات المياه والري الأوروبية.

اتحاد MADFORWATER

يتكون اتحاد MADFORWATER من 18 شريك موزعين جغرافيا بشكل رئيسي حول البحر المتوسط في 7 دول أوروبية، و3 دول أفريقية متوسطية والصين. كما يتضمن 9 جامعات، و 4 مراكز للبحوث، ومنظمة واحدة غير هادفة للربح (الفاو)، واستشاري وخبير واحد في مجال التسويق ووضع خطط الأعمال التجارية وإدارة عملية الابتكار ، و3 خبراء في مجالي معالجة المياه العادمة (مياه الصرف) والري. إن شركاء المشروع لديهم خبرة في مجالات متعددة بما في ذلك معالجة المياه العادمة، والري، وتحليل دورة حياة الوسائل التكنولوجية، وتحليل التكلفة مقارنة بالفائدة، وتحليل قابلية التعرض لمشكلات نقص المياه، ومشاركة أصحاب المصلحة، والإدارة المتكاملة للموارد المائية، وبناء القدرات، ووضع خطط الأعمال التجارية.



اجتماعات المشروع السابقة



اجتماع إطلاق مشروع MADFORWATER

في 15 و 16 يونيو/حزيران 2016 ، التقى الأعضاء الشركاء في اتحاد مشروع MADFORWATER في مدينة بولونيا لإطلاق المشروع بشكل رسمي. وقد شارك في الاجتماع 45 ممثلا عن الشركاء الثمانية عشر حيث ناقشوا خطة العمل والجدول الزمني لكونهما أساس العمل الي سيتم تنفيذه في غضون السنوات الأربع القادمة.

وقد عقد الاجتماع الثاني للمشروع في أغادير بالمغرب من أجل تحليل أنشطة المشروع التي تم تنفيذها حتى تاريخه وتخطيط المبادرات القادمة.

المجلس الاستشاري لمشروع MADFORWATER

تمثل ملاءمة والحلول التكنولوجية والإدارية التي يطرحها المشروع بحيث تتناسب مع الاحتياجات الحقيقية والواقع المحلي للدول الأفريقية المتوسطية المستهدفة جانبا بالغ الأهمية لمشروع MADFORWATER. ولهذا يقوم المشروع بأخذ مشورة مجلس استشاري بشكل دوري. ولا يضم هذا المجلس فقط ممثلين عن الشراكة الأوروبية للحلول المبتكرة في مجال المياه، والمبادرات المشتركة لوضع برامج قطاع الموارد المائية، وبرنامج الأمم المتحدة للبيئة، وبرنامج تكنولوجيا امدادات المياه والصرف الصحي، والمركز الوطني الإسباني للبحوث بل أيضاً أصحاب المصلحة المعنيين بمجال معالجة المياه وإدارتها وإعادة استهلاكها في مصر والمغرب وتونس. ويقدم أصحاب المصلحة هؤلاء معلومات لتقييم ملاءمة التدابير المتخذة والقبول المجتمعي للحلول المطروحة بشكل دوري وذلك لتقليص المعوقات التي تحول دون التنفيذ الفعلي للمشروع واستغلال التكنولوجيات والأدوات التي يطرحها.

هذا وقد تم عقد أول ورشة عمل تشاورية لأصحاب المصلحة في 16 ديسمبر2016 في مدينة أغادير بالمغرب، وفي غضونها تم التركيز على ملاءمة الأدوات التكنولوجية وغير التكنولوجية (الإدارة، والرقابة والتدريب) وتحديد المعوقات والمحركات التي من شأنها تعزيز إعادة استعمال المياه العادمة المعالجة في الري.

شارك في ورشة العمل من المغرب 15 من أصحاب المصلحة كما شارك اثنان من تونس، بالإضافة إلى علماء يمثلون شركاء عديدين في مشروع MADFORWATER. وفي سياق ورشة العمل تم تحديد المعوقات في سبيل معالجة المياه العادمة وإعادة استعمالها لأغراض الري في البلدان الثلاثة المستهدفة كالآتي: عدم وجود إرادة سياسية تسمح بالتنسيق والتواصل فيما بين المؤسسات المعنية بمعالجة المياه العادمة؛ وصعوبة تحديد المؤسسة المسؤولة عن إعادة استعمال المياه العادمة؛ وعدم تعريف الأدوار؛ ونقص الموارد المالية لتمويل معالجة المياه العادمة ومراقبة جودتها، وعدم وجود تشريعات واضحة فيما يختص بإعادة استعمال المياه العادمة المعالجة لأغراض الري. بصفة عامة، اتفق أصحاب المصلحة على ضرورة إيجاد مؤسسة متعددة التخصصات بمهام جديدة تركز على إعادة استعمال المياه العادمة المعالجة وذلك للتغلب على تجزئة المسؤوليات والتنسيق بين المؤسسات الموجودة بالفعل.

مؤتمر أفريالیانس

شارك المشروع في مؤتمر أفريالیانس الذي عقد في جنوب أفريقيا في الفترة من 22 إلى 24 مارس. وقد استغرق المؤتمر يومين ونصف بالتزامن مع اليوم العالمي للمياه. كما تم في غضونه عرض مجموعات العمل الخاصة بأفريالیانس ومجالات نشاطها وإلقاء الضوء على المبادرات الأفريقية المتعلقة بالبحوث والابتكار والسياسات وتنمية القدرات، والتي كانت تبحث عن شركاء أوروبيين أو العكس. وقد أتاح المؤتمر الفرصة للحصول على معلومات ومقترحات من أجل تنقيح أنشطة أفريالیانس بشكل أفضل.

مؤتمر الأطراف بمراكش COP22

تم أيضاً عرض المشروع في مراكش في نوفمبر 2016 خلال مؤتمر الأطراف COP22، وهو أحد المؤتمرات السنوية التي تنعقد ضمن مؤتمرات الأمم المتحدة المعنية بتغير المناخ والذي يتم تنظيمه في إطار اتفاقية الأمم المتحدة الإطارية المعنية بتغير المناخ. كذلك شارك مشروع MADFORWATER في أحد الفعاليات الجانبية للمفوضية الأوروبية تحت عنوان: «المياه- الطاقة-الغذاء: بحوث وابتكارات تتناول العلاقة بينها في منطقة المتوسط»، بهدف ربط الجهات الفاعلة المؤسسية بالموارد البحثية والابتكارية. وقد تركزت المناقشات تحديداً على التحديات الناتجة عن الصلة بين المياه والطاقة والغذاء في المنطقة المتوسطية.

252nd ACS National Meeting
organized by American Chemical Society
24 august 2016

GRICU - The 2020 horizons
of chemical engineering
13 September 2016 - Anacapri (Italy)

IWA Flotation Conference
Toulouse - 29 september 2016

1ST TUNISIAN-SOUTH AFRICAN
INTERNATIONAL WORKSHOP
4-7 November 2016 Tunisia

Water Global Expo
Ecomondo 2016 Fair
8 November 2016 - Rimini (Italy)

ICEST 2017
13 - 15 January 2017

WaterHeroes,
Center for Mediterranean Integration
21/22 March 2017 – Marseilles

Conference presentation in 7th Mikrobiokosmos Conference 2017
7 - 9 April 2017 - Athens, Greece

Industry Water: From Single Use to Integrated Management
20 April 2017 - Bruxelles

The EGU General Assembly 2017
22-28 April 2017 - Vienna, Austria

Attualità dell'Idraulica Agraria e delle Sistemazioni Idraulico-Forestali al cambiare dei tempi
Università degli Studi di Palermo - 4/5 May 2017

مناسبات ومحافل قادمة سوف يتم خلالها عرض مشروع MADFORWATER

6th International Symposium on Biosorption and Biodegradation
Biobio2017. 25-29 June 2017,
Praga, Czech republic

9th International Conference on Environmental Engineering and Management
6 – 9 September 2017
Bologna, Italy

22nd Workshop on the Developments in the Italian PhD Research on Food Science, Technology & Biotechnology.
September 20-22, 2017, LIBERA UNIVERSITÀ DEGLI STUDI DI BOLZANO

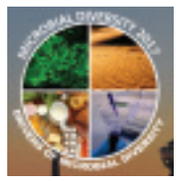
14th International Phytotechnologies Conference
25 - 29 September 2017
Montréal, Canada

10th World Congress of Chemical Engineering.
1-5 October 2017,
Barcelona, Spain

ICIDC 2017, Internationa Commission on Irrigation and Drainage Conference
8-14 October 2017, Mexico

S2SMALL2017 IWA,
Sustainable solution for small water and wastewater treatment systems

22-26 October 2017, Nantes, France



4th International Conference on Microbial Diversity 2017

October 24-26, 2017, Bari, Italy

ECOMONDO
the green technologies expo

Ecomondo 2017
Green & Circular Economy.

7-10 November 2017, Rimini, Italy

INTERNATIONAL SYMPOSIUM MICROBE-ASSISTED CROP PRODUCTION OPPORTUNITIES, CHALLENGES & NEEDS.

November 21 – 24, 2017 Vienna, Austria

VII Bioremediation Conference.

25-28 June 2018, Chania, Greece

لمزيد من المعلومات حول المشروع يمكنكم زيارة الموقع الإلكتروني لمشروع MADFORWATER على العنوان التالي:
www.madforwater.eu

تم تمويل هذا المشروع من قبل برنامج البحوث والابتكار أفق 2020 التابع للاتحاد الأوروبي بموجب اتفاق منحة رقم 688320 .

MADFORWATER

Le développement et l'application de solutions technologiques et de gestion cohérentes pour le traitement des eaux usées et leur réutilisation efficace pour une agriculture adaptée aux besoins des pays méditerranéens africains

www.madforwater.eu

Chère lectrice, cher lecteur,

Bienvenue au premier bulletin de MADFORWATER, un projet de l'Action de Recherche et d'Innovation Horizon 2020 financé dans le cadre de l'action WATER-5c-2015 sous le thème « Développement de la technologie, des systèmes et des outils et / ou méthodologies d'approvisionnement en eau et d'assainissement. » L'objectif général de MADFORWATER est de développer un ensemble de solutions technologiques et de gestion cohérentes pour améliorer le traitement des eaux usées, leur réutilisation pour l'irrigation, et l'utilisation efficace de l'eau dans l'agriculture en Egypte, au Maroc, et en Tunisie. MADFORWATER se concentrera sur les eaux usées municipales, agro-industrielles, et industrielles, ainsi que sur les eaux du canal de drainage du delta du Nil. Le développement et la validation des technologies seront combinés à la définition des stratégies intégrées de gestion de l'eau, adaptées au contexte local des bassins hydrologiques sélectionnés en Egypte, au Maroc, et en Tunisie. MADFORWATER, qui a débuté le 1er Juin 2016, marque son 12ème mois d'activité.

Ce bulletin d'information contient :

1. Une mise à jour sur les activités de MADFORWATER (p.2).
2. Une liste des conférences où MADFORWATER a été présenté ou sera présenté (p.10).
3. Une description de notre consortium (p.13).

Bonne Lecture ! Si vous souhaitez recevoir plus d'information ou créer des collaborations, n'hésitez pas à nous contacter :

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Site Internet : www.madforwater.eu

Mise à jour sur les activités de MADFORWATER

L'eau et les vulnérabilités liées à l'eau en Egypte, au Maroc, et en Tunisie

Le centre de recherche de Wageningen est responsable de l'évaluation des vulnérabilités liées à l'eau en Egypte, au Maroc, et en Tunisie. L'entité et les causes du stress hydrique et des vulnérabilités liées à l'eau, en Egypte, au Maroc, et en Tunisie sont analysés en se focalisant sur le traitement des eaux usées, la réutilisation efficace de l'eau dans l'agriculture et leurs impacts sur la sécurité alimentaire, l'agriculture durable, la croissance socio-économique, et la protection de l'environnement. Dans le PT1 (plan de travail 1), une analyse au niveau du pays sera intégrée par des évaluations plus spécifiques des 3 bassins/sous-bassins ciblés.

La première tâche est d'analyser les accords de coopération internationaux actuels et leurs implications sur les objectifs liés à l'eau en Egypte, au Maroc, et en Tunisie. Cette tâche examine les activités de coopération internationales et les accords internationaux dans lesquels les 3 pays concernés sont engagés dans le domaine de la gestion des ressources en eau à différents niveaux : initiatives globales, comme les Nations Unies ; Euro-méditerranéen, comme l'Union pour la Méditerranée ; et les accords avec les pays Africains voisins. Les résultats de cette tâche seront utilisés dans la tâche suivante qui s'agit d'identifier les vulnérabilités de l'eau associées au manque de coopération internationale.

La seconde tâche consiste à analyser et cartographier le stress hydrique, les vulnérabilités liées à l'eau, et le potentiel de réutilisation des eaux en Egypte, au Maroc, et en Tunisie. Cette analyse est effectuée à l'échelle nationale des pays en se concentrant sur le traitement des eaux usées, la réutilisation de l'eau, et l'utilisation efficace de l'eau dans l'agriculture. Les éléments recueillis grâce à l'évaluation du stress hydrique et des vulnérabilités seront utilisés dans l'évaluation du potentiel de réutilisation des eaux usées traitées dans chaque bassin des pays ciblés. Cette tâche se compose de 5 étapes :

- Définition des indicateurs de vulnérabilité de l'eau ;
- Collecte de données sur le stress hydrique et la vulnérabilité provenant de diverses sources ;
- Élaboration de plans de stress hydrique et de vulnérabilité de l'eau dans chaque pays, en mettant l'accent sur la disponibilité de l'eau, la demande d'eau, les principales contraintes d'eau, le système intégré des terres et de l'eau ;
- Cartes de prévision : Projection du stress hydrique et des vulnérabilités liées à l'eau sur 20 ans basée sur les différents changements climatiques et scénarios socio-économiques ; et
- Identification des opportunités commerciales.

La troisième tâche du PT1 consiste à analyser et cartographier les effets du stress hydrique sur la sécurité alimentaire et le développement socio-économique en Egypte, au Maroc, et en Tunisie. Les effets identifiés du stress hydrique et des vulnérabilités liées à l'eau sur les différentes dimensions de la sécurité alimentaire et du développement socio-économique sont abordés et analysés suivant le modèle DPSIR (éléments moteurs-pressions-état-incidences-réactions). L'analyse effectuée à l'échelle nationale dans les 3 pays cibles conduira à la production d'un rapport et de deux cartes de risque de sécurité alimentaire, en référence à la situation actuelle et à une projection sur 20 ans La dernière tâche consiste à évaluer en détail le stress hydrique et les vulnérabilités liées à l'eau dans chacun des 3 bassins sélectionnés, pour explorer des stratégies pour l'utilisation non conventionnelle de l'eau. L'analyse dans cette tâche est effectuée en deux étapes :

- L'élaboration d'un cadre d'évaluation régionalement adapté des vulnérabilités liées à l'eau, basé sur l'approche du modèle DPSIR et comprenant l'identification d'un nombre limité d'indicateurs de vulnérabilité de l'eau ; et
- L'identification des obstacles à la suppression des vulnérabilités et contraintes de l'eau identifiées. Les obstacles examinés comprendront les aspects suivants: l'aspect environnemental (par exemple, une faible disponibilité par habitant des eaux de surface et des eaux souterraines, et / ou une mauvaise qualité dans la région), l'aspect technique (qualité des eaux usées traitées, disponibilité de techniciens qualifiés et usines efficaces de traitement des eaux usées, les exigences légales pour la décharge et la réutilisation de l'eau, la disponibilité d'un approvisionnement énergétique fiable, la proximité des zones agricoles des usines de traitement de l'eau), l'aspect économique (investissements des acteurs publics et privés) et l'aspect sociétal (perception de la réutilisation des eaux usées traitées pour l'agriculture).WW reuse for agriculture).

Adaptation des technologies de traitement des eaux usées pour une réutilisation agricole

MADFORWATER élabore et adapte au contexte local de la Tunisie, du Maroc et de l'Egypte, des technologies pour le traitement des eaux usées municipales, de l'industrie textile, agro-industrielles, en particulier les eaux usées des pressoirs à olives et du processus de conditionnement des fruits et des légumes, et les eaux du canal de drainage du Delta du Nil (Egypte), afin de produire de l'eau appropriée à l'irrigation. Onze technologies de traitement des eaux usées ont été sélectionnées pour un dépistage initial à l'échelle du laboratoire des solutions potentielles et des chaînes de traitement spécifiques aux différents types des eaux usées (Fig. 1). Les besoins en énergie et / ou le capital et les coûts de maintenance ont été pris en considération dans la sélection des technologies, en gardant à l'esprit que ce sont les principaux freins liés aux technologies de l'eau adoptées dans les 3 pays méditerranéens africains ciblés. La plupart des technologies de MADFORWATER pour le traitement des eaux usées sont des technologies déjà existantes et commercialisables qui sont à présent faiblement ou pas du tout appliquées dans les 3 pays méditerranéens africains, pour lesquelles des innovations sont en voie de développement afin de les adapter au contexte local du pays méditerranéen-africain et à la production d'eau de qualité suffisante pour d'irrigation, quelques technologies demeures encore aux premiers stade de développement. Les technologies proposées font l'objet d'une enquête dans des unités de laboratoire pré-pilote (5-10 L), dans des conditions similaires à ceux des pays ciblés (par exemple, la température, les rayonnements solaires, etc.), en utilisant des eaux usées synthétiques ou réelles (ou de l'eau de drainage) échantillonnées dans les sites suivants dans les 3 pays méditerranéens africains choisis : Zone pilote de Manzala, Egypte du nord-est (eaux de canal de drainage); Drarga, Agadir, Maroc (eaux usées municipales); Tiznit, Agadir, Maroc (eaux usées municipales); Université de Manouba, bâtiment de biotechnologie, Tunis, Tunisie (eaux usées municipales); Taroudant, Maroc (eaux usées du processus de conditionnement des fruits et des légumes); Mnihla, Tunisie (eaux usées des pressoirs à olives); Nabeul, Tunisie (eaux usées de l'industrie textile).

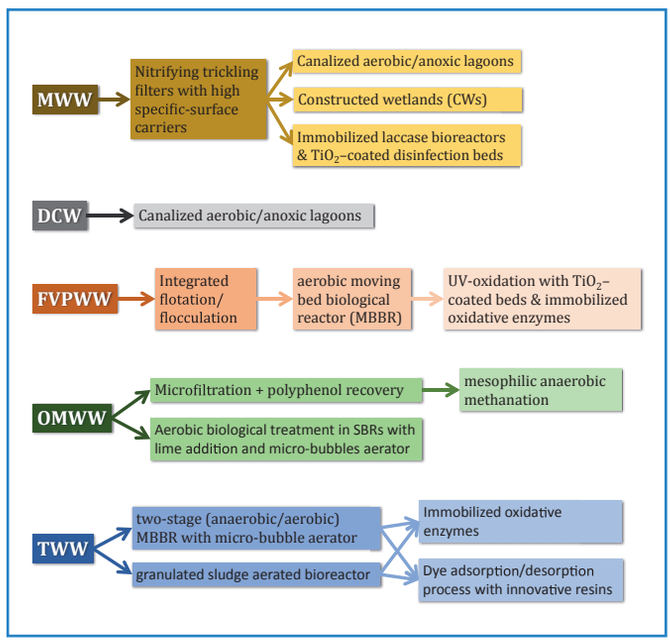


Fig. 1 – Chaînes de traitement potentielles pour chaque type d'eau usée

Les technologies sélectionnées suivantes sont en cours d'étude :

Technologie de traitement des eaux usées numéro 1 : Lagune canalisée avec une capacité de nitrification / dénitrification et de désinfection pour le traitement tertiaire des eaux usées municipales et le traitement des eaux du canal de drainage. Les lagunes facultatives canalisées sont caractérisées par l'alternance des zones aérobies et anoxiques, qui les rendent adaptées aux processus de nitrification / dénitrification et à l'élimination biologique de la DBO (Demande biologique d'oxygène) et du phosphore. Dans les pays d'Afrique du Nord, grâce à la forte radiation solaire, les lagunes peuvent également effectuer une désinfection très efficace. Elles peuvent également être utilisées comme réservoirs pour stocker l'eau d'irrigation à utiliser pendant les saisons sèches. Dans le contexte Egyptien, l'objectif de MADFORWATER est d'optimiser l'utilisation des canaux de drainage existants qui reçoivent des eaux de drainage et des eaux usées locaux comme lagunes facultatives canalisées grâce à des modifications appropriées en termes de géométrie et de dynamique des fluides.

Technologie de traitement des eaux usées numéro 2 : Lits bactériens de nitrification remplis de porteurs innovants caractérisés d'une surface spécifique élevée pour le traitement secondaire des eaux usées municipales. Dans le cas des communautés de taille moyenne ou petite, les lits bactériens peuvent représenter une alternative intéressante aux usines de boues actives grâce à la faible ou nulle consommation d'énergie requise pour l'aération des eaux usées. Alors que les lits bactériens traditionnels sont caractérisés par des temps de rétention élevés et de mauvaises performances de nitrification / dénitrification, MADFORWATER développe des filtres caractérisés par des porteurs innovants à haute surface afin (i) de réduire les temps de rétention grâce à une épaisseur élevée de biofilm et (ii) d'améliorer les performances de nitrification / dénitrification.

Technologie de traitement des eaux usées numéro 3 : Zones humides construites avec des bactéries promotrices de la croissance des plantes pour le traitement tertiaire des eaux usées municipales. Les zones humides construites ont le potentiel d'éliminer les polluants prioritaires, l'azote, le phosphore, les métaux lourds, et la DBO résiduelle, grâce à l'effet combiné des plantes et de la communauté microbienne de la rhizosphère. La coexistence de microenvironnements anoxiques-aérobies-anaérobies favorise les différents mécanismes d'élimination. Les bactéries promotrices de la croissance des plantes peuvent jouer un rôle clé dans les zones humides construites en coopérant activement avec les plantes dans le processus de dégradation.

Technologie de traitement des eaux usées numéro 4 : Dégradation enzymatique des polluants, des colorants, et des fongicides émergents avec des laccases immobilisées, pour le traitement tertiaire de eaux usées municipales, de l'industrie textile, et du processus de conditionnement des fruits et des légumes. Les enzymes oxydatives immobilisées telles que les laccases présentent un intérêt particulier pour l'élimination des colorants des eaux

usées de l'industrie textile, l'élimination des fongicides des eaux usées du processus de conditionnement des fruits et des légumes et l'élimination des micropolluants des eaux usées municipales en raison de leur sélectivité extrême par rapport à d'autres procédés d'oxydation ou adsorption avancés. Les laccases ne nécessitent pas de cofacteurs, et la robustesse et la réutilisabilité des laccases immobilisées sont démontrées. Elles peuvent être produites avec des technologies de fermentation simples et peu coûteuses (par exemple, fermentation en milieu solide), possiblement en utilisant des résidus agro-industriels peu coûteux et disponibles localement. Les coûts du processus de traitement des eaux usées peuvent également être réduits en considérant les systèmes de tour de filtration plutôt que les bioréacteurs à membrane.

Technologie de traitement des eaux usées numéro 5 : Lits de désinfection catalytique activés par la lumière solaire UV pour le traitement des eaux usées municipales. La désinfection des eaux usées à l'aide de lits catalytiques activés par des rayons UV est une alternative efficace à faible coût et à faible impact environnemental aux systèmes classiques de désinfection. Ils sont bien adaptés aux conditions locales du contexte nord-africain, où une forte intensité de rayonnement solaire existe. Technologie de traitement des eaux usées numéro 6 : Processus intégré de flottation / floculation, pour le traitement des eaux résiduelles du processus de conditionnement des fruits et des légumes. La flottation représente une alternative intéressante à la sédimentation grâce à la réduction des volumes de traitement et à l'augmentation de l'efficacité du traitement. Le processus conjugué de flottation / floculation proposé par MADFORWATER permet d'obtenir des taux d'élimination élevés non seulement pour les solides en suspension, mais aussi pour la DBO. Il se caractérise par un temps de rétention hydraulique (TRH) très bas (3-4 minutes), un faible taux de recyclage, et une faible consommation énergétique.

Technologie de traitement des eaux usées numéro 7 : Filtration membranaire + adsorption de composés phénoliques avec des résines sélectives + digestion anaérobie dans un réacteur à biofilm pour le traitement des eaux usées des pressoirs à olives. Bien que plusieurs types de processus aient été proposés dans la littérature pour traiter les eaux usées des pressoirs à olives, aucun d'entre eux n'a été adapté à des applications à très faible coût jusqu'à présent. La chaîne de traitement proposée par MADFORWATER est proche de l'application industrielle. Elle peut produire un effluent final adapté à l'irrigation, et chaque étape mène à une valorisation spécifique des eaux usées des pressoirs à olives : pâte d'olive à partir de la filtration, des mélanges riches en polyphénols avec des propriétés antioxydantes élevées provenant de l'adsorption / désorption, de l'électricité et du chauffage à partir de la digestion anaérobie. Le processus d'adsorption / désorption sera caractérisé par le recyclage complet du solvant de désorption. La digestion anaérobie peut être effectuée en une co-digestion possible et / ou en alternance avec d'autres déchets typiques du contexte Nord-Africain.

Technologie de traitement des eaux usées numéro 8 : Réacteur discontinu séquentiel (RDS) aérobie avec addition de chaux pour le traitement des eaux usées des pressoirs à olives. Le processus du RDS présente plusieurs avantages potentiels par rapport à d'autre processus aérobies traditionnels. La mise en œuvre du processus du RDS aérobie pour le traitement des eaux usées des pressoirs à olives est particulièrement intéressant, ceci d'après des études pilotes réalisées par les partenaires de MADFORWATER. Pour minimiser la consommation énergétique associée à l'oxygénation, un nouveau système de distribution d'air à haute efficacité basé sur la production de microbulles sera mis en œuvre dans le processus du RDS

Technologie de traitement des eaux usées numéro 9 : Bioréacteur à boue granulaire pour le traitement des eaux usées de l'industrie textile. Des boues granulées aérobies ont été proposées dans ces dernières années comme une technologie de traitement secondaire compacte, robuste et à faible consommation d'énergie pour les effluents industriels. MADFORWATER aborde les faiblesses potentielles des bioréacteurs aérés à boues granulées en développant des consortiums stables adaptés au traitement des réelles eaux usées de l'industrie textile, et en étudiant les mécanismes de la formation de boue granulaire et les facteurs assurant sa stabilité.

Technologie de traitement des eaux usées numéro 10 : Réacteur biologique à lit mobile pour le traitement des eaux usées de l'industrie textile. Le réacteur biologique à lit mobile (RBLM) trouve de plus en plus d'applications à l'échelle industrielle, pour le traitement des eaux usées à grande charge. Son application au traitement des eaux usées de l'industrie textile est innovatrice et pourrait conduire à une réduction significative des coûts de traitement. Un RBLM à deux étapes (anaérobie / aérobie) avec l'étape aérobie aérée par un oxygénateur novateur de Nanotera Group est en cours de développement.

Technologie de traitement des eaux usées numéro 11 : Traitement des eaux usées de l'industrie textile par adsorption avec des résines innovantes. Le processus proposé d'adsorption / désorption vise à éliminer les amines aromatiques, la couleur brune et les métaux. Les microsphères polyacryliques magnétiques précédemment développées par le partenaire chinois de MADFORWATER seront adaptées en modifiant la taille des pores et les groupes fonctionnels. Un capteur UV / Fluorescence en ligne, conçu pour surveiller les amines aromatiques et les chromophores, sera intégré au système en tant que signal de feedback, afin d'obtenir une optimisation automatique des paramètres opérationnels. La possibilité de réutiliser le matériau désorbé dans l'industrie textile sera évaluée. Les performances seront comparées à celles obtenues avec des procédés d'oxydation avancés (traitement électrolytique avec électrodes en diamant dopées au bore), prises en tant que technologie de référence.

Pour chacune des technologies, les conditions opérationnelles (telles que le temps de rétention hydraulique (TRH), le taux de chargement organique (TCO), le taux de recyclage (là où applicable), caractérisées par une meilleure efficacité et taux d'élimination en ce qui concerne les principaux polluants de chaque eau résiduelle testée seront identifiées. La qualité des effluents sera évaluée sur la base des normes internationales pour la réutilisation des eaux usées dans l'agriculture. Les technologies pour le traitement des eaux usées municipales et de l'eau de drainage seront également évaluées en fonction de l'efficacité de la désinfection. Finalement, l'Analyse du Cycle de Vie (AVC) et l'Analyse Coûts-Bénéfices (ACB) des technologies seront menées pour évaluer et améliorer leur performance environnementale et les évaluer en termes de coûts et de chiffre d'affaires projetés. Les résultats de ces activités fourniront les éléments pour la sélection et la mise à l'échelle des technologies qui seront encore testées et adaptées pendant les projets pilotes sur le terrain qui seront construits et opérés dans les 3 pays méditerranéens- africain ciblés.

Adaptation des technologies pour une gestion efficace de l'eau et la réutilisation des eaux usées traitées dans l'agriculture

Le PT3 se concentre sur les solutions innovantes pour la réutilisation efficace des eaux usées traitées dans l'agriculture de manière adaptée au contexte méditerranéen. Durant la première année du projet, des recherches sur plusieurs approches et technologies ont été lancées et des activités ont été menées dans les domaine suivants : Bactéries promotrices de la croissance des plantes (PCP) pour améliorer la résistance des cultures au stress hydrique et à la salinité ; Nouvelle génération de tensiomètres adaptés aux eaux usées traitées à haute salinité ; Outil de modélisation pour l'établissement d'un calendrier d'irrigation optimal avec différents types d'eau ; développement d'un mini-arroseurs à basse pression et de buses calibrées pour une irrigation localisée pour la modernisation de l'irrigation traditionnelle de surface; développement d'un modèle physique-économique intégré pour l'optimisation des terres et de l'eau. Enfin, une Analyse du Cycle de Vie (ACV) et une Analyse de Coûts-Bénéfices (ACB) des technologies de réutilisation des eaux usées testées ont été initiées.

Le Maroc et La Tunisie, en collaboration avec Le Centre International des Hautes Etudes Agronomiques Méditerranéennes (CIHEAM) et la Università degli studi di Milano (UMIL), ont mené des essais expérimentaux pour étudier l'effet des souches de bactéries promotrices la croissance des plantes (PCP) sur la croissance et le rendement de différentes cultures. Les bactéries ont été isolées en utilisant différents types de milieux de culture bien adaptés à la condition de sécheresse. Plusieurs échantillons de sol et de matière organique ont été recueillis d'oliviers et d'arganiers au Maroc et 400 bactéries ont été isolées. En Tunisie, une collection de souches bactériennes a été obtenue à partir du système racinaire de l'olivier (100 isolats), du citronnier (50 isolats), et du figuier (40 isolats), tous actuellement irrigués avec de l'eau usée traitée. De plus, 80 bactéries endophytes ont été isolées à partir de luzernes (Medicago spp.), tandis que 500 souches ont été établies à partir de sorgho (Sorghum) irrigué avec des eaux usées traitées. Plus en détail, un génotypage et une identification ont été réalisés grâce au séquençage du gène 16S rARN sur les isolats d'Argania spinosa et sur un sous-ensemble d'isolats de Sorghum, cela pour sélectionner des souches bactériennes pour d'autres cultivars.

De plus, huit Bactéries promotrices la croissance des plantes (PCP), préalablement isolées dans le laboratoire de l'UMIL à partir de plantes extrémophiles telles que la salicorne (Salicornia sp.), ont été testées en serre à l'aide de tomate en tant que plante de référence et en suscitant un stress hydrique artificiel. Jusqu'à présent, des résultats positifs n'ont été observés pour certaines bactéries qu'au milieu de la saison de croissance (croissance accrue des plantes immunisées par rapport aux témoins non-immunisés). Pour cette raison, une autre expérience en serre est effectuée au CIHEAM pour étudier les avantages des bactéries sur le cycle de végétation de la tomate. Cinq souches bactériennes ont été sélectionnées en fonction de leurs effets positifs sur la survie et / ou la croissance de certaines plantes résistantes à la sécheresse (par exemple, la salicorne, la mangrove, la plante de la résurrection) cultivées dans les pays impliqués dans le projet. Les bactéries ont été isolées et identifiées pour exclure les agents pathogènes. Après la préparation du lit de semence au CIHEAM, des plantules ont été transplantées dans des pots remplis de sol échantillonné des champs expérimentaux au CIHEAM, alors que les souches de bactéries ont été inoculées dans le sol une semaine plus tard. Les plantes de tomates en pot sont cultivées sous trois régimes d'eau différents, afin d'observer si les bactéries promotrices de la croissance des plantes (PCP) réduisent la quantité d'eau fournie en augmentant l'utilisation efficace de l'eau des cultures (rendement / eau appliqué) de tomate. Les paramètres du sol et des cultures et le micro climat de serre sont surveillés pendant la saison de croissance de la tomate.

Quant à la génération de tensiomètres adaptés aux eaux usées traitées à haute salinité, les travaux ont été axés sur la sélection du meilleur compromis en termes de matériel (milieu poreux) et de développement d'un banc d'essai. Ce banc sera utilisé pour vérifier la performance des tensiomètres dans la chaîne de production. Une version préliminaire du logiciel de planification optimale de l'irrigation avec différents types d'eau et le manuel complémentaire ont été préparés, tandis que le module sur la gestion de la fertilisation est encore en cours. En ce qui concerne le mini-arroseurs à basse pression, un ensemble de tests de dimensionnement des gouttelettes d'eau a été effectué pour déterminer la gamme de dimensions des gouttelettes selon le type d'émetteurs. Des prototypes de buses calibrées pour une irrigation localisée ont été produites et testées pour évaluer leur capacité de lutter contre les fuites d'eau. Elles sont efficaces à une pression d'environ 0.4bar. La modélisation numérique de l'interaction du flux et du fluide avec la membrane est en cours d'étude. Le terrain d'expérimentation en Egypte a été aménagé pour tester les technologies pour la modernisation et l'augmentation de l'efficacité de l'irrigation traditionnelle de surface. Les activités en relation au modèle d'optimisation intégré ont débuté avec une collection de données économiques dans les zones d'études de cas sélectionnés: les serres et le système de culture d'agrumes dans les zones de Souss et Chtouka Ait Baha dans le bassin du fleuve Souss Massa (Maroc) et le système de culture irriguée dans la région de Kafr-El-Shiekh (Égypte).

Finalement, un questionnaire commun à propos de l'Analyse du Cycle de Vie (ACV) et l'Analyse Coûts-Bénéfices (ACB) a été préparé et envoyé à chaque partenaire : Une analyse des résultats et une compilation des éléments qualitatifs seront présentées dans un rapport. Un inventaire des éléments qualitatifs de l'ACB a été effectué et finalisé.

Analyse du cycle de vie (ACV) et analyse des couts-bénéfices (ACB)

Une évaluation du cycle de vie (ACV) quantifiera, à un stade précoce, les impacts et bénéfices environnementaux potentiels des technologies de MADFORWATER. L'analyse sera menée sur les technologies de traitement des eaux usées et d'irrigation suite aux étapes clairement établies : définition des objectifs et du champ d'étude, inventaire du cycle de vie, évaluation et interprétation de l'impact, comme le montre la figure ci-dessous.

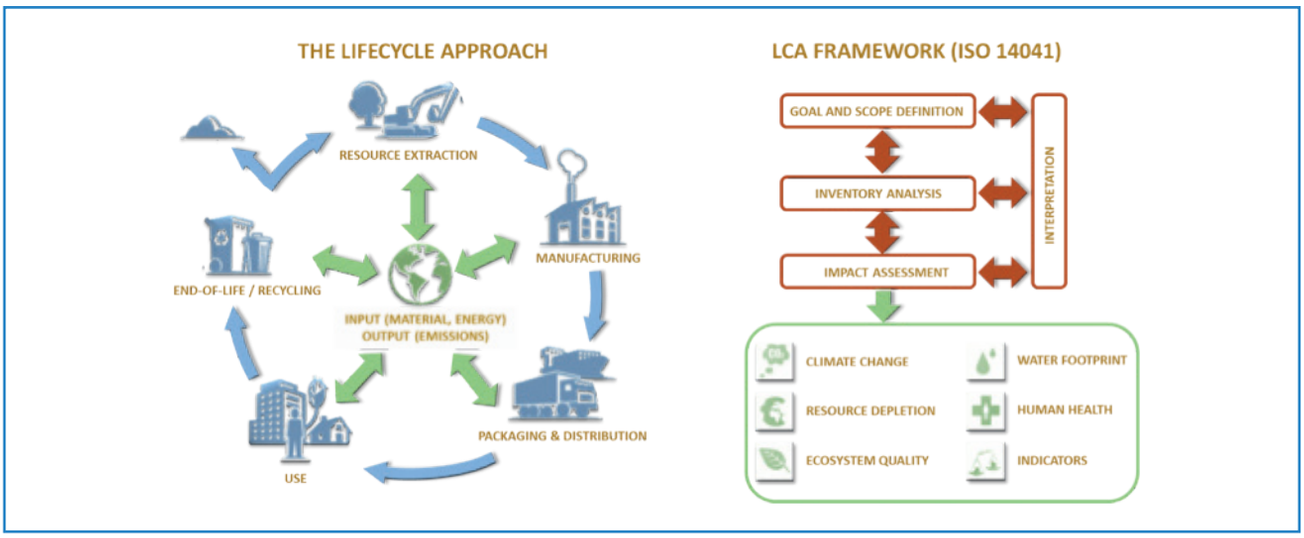


Fig. 2 – Approche, du cycle de vie, cadre et catégories d'impacts.

Une ACV à un stade précoce de développement de technologies fait face à plusieurs difficultés, car l'inventaire est basé sur des technologies en cours de développement et les processus peuvent ne pas être encore bien définis. Par contre, une ACV à un stade précoce peut également favoriser et directement soutenir l'amélioration de la performance environnementale des technologies développées en identifiant les principaux processus contribuant aux impacts environnementaux tout en œuvrant à les optimiser. Etant donné que de nombreuses estimations de données seront nécessaires pour l'inventaire, la méthodologie de l'ACV sera simplifiée afin de fournir des informations pertinentes pour assurer toute optimisation possible des impacts environnementaux des technologies et de démontrer les avantages environnementaux de la mise en œuvre des technologies développées par rapport aux situations actuelles. L'Université des Sciences appliquées et des Arts du nord-ouest de la Suisse effectuera l'analyse à l'aide d'un logiciel et d'une base de données de pointe. L'ACV basée sur les résultats du développement à l'échelle d'un laboratoire des technologies de traitement des eaux usées, sera mise à jour ultérieurement, en tenant compte des performances des essais pilotes sur le terrain. L'Analyse couts-bénéfices (ACB) quantifiera les coûts et les avantages économiques des technologies de MADFORWATER à un stade précoce.

L'ACB est une estimation systématique de tous les coûts et avantages pertinents. L'évaluation des technologies développées en termes de coûts prévisionnels et de chiffre d'affaires sera réalisée au moyen d'une analyse couts-bénéfices (ACB). Conformément à l'ACV, l'ACB à un stade précoce du développement technologique fait face à plusieurs difficultés, cela car l'analyse est basée sur des technologies en cours de développement et les processus peuvent ne pas être encore bien définis. L'ACB Sera effectuée en trois étapes principales. Durant la première étape, le cadre de l'ensemble de données de l'ACB sera déterminé. La partie la plus importante de cette étape est l'identification des coûts et des avantages liés à chaque technologie. Des exemples de coûts sont : le capital, l'exploitation, la maintenance et les coûts supplémentaires tels que la formation et les frais généraux, les coûts sociaux / environnementaux imposés aux tiers par chaque technologie de traitement des eaux usées, telles que les impacts liés au bruit ou au carbone. Des exemples de bénéfices sont : avantages pour la santé liée à l'irrigation avec des eaux usées traitées au lieu des eaux non traités, ou des avantages environnementaux liés à une diminution du bassin versant d'eau douce provenant des masses d'eau. D'autres parties de cette étape sont (1) la détermination du cas de base ; (2) l'identification de la période de planification pour l'évaluation d'une technologie ; et (3) la détermination d'un taux d'actualisation pour convertir les valeurs futures en valeurs présentes.

Dans une deuxième étape, les coûts et les bénéfices de chaque technologie de MADFORWATER seront quantifiés. Pour une estimation correcte des coûts et des avantages, chaque partenaire travaillant sur une technologie sera guidé par PNO Innovatieadvies BV (PNO) et l'Università di Bologna (UNIBO) dans la quantification des éléments requis pour l'ACB de chaque technologie, en référence à une taille normalisée de l'installation de traitement des eaux usées. Tous les coûts et avantages seront éventuellement actualisés en utilisant un taux d'actualisation approprié et un horizon temporel. L'étape finale de l'ACB est l'évaluation économique et la comparaison des différentes technologies grâce à l'application du modèle de l'ACB. Outres les calculs et les comparaisons, une vérification et une analyse de sensibilité sont effectuées pour assurer la validité du modèle de l'ACB.

À ce stade, des informations qualitatives concernant les coûts et avantages pertinents ont été collectées pour les technologies de MADFORWATER. PNO développe actuellement le cadre de calcul pour l'ACB et effectue une analyse préliminaire pour certaines technologies qui tiennent des informations quantitatives disponibles. En fin de compte, des données quantitatives seront recueillies pour toutes les technologies et utilisées pour donner un aperçu de leur performance économique.

Essais pilotes sur le terrain pour l'adaptation et l'intégration des technologies

Au cours des 3ème et 4ème années de MADFORWATER, les technologies de traitement des eaux usées et de la réutilisation de l'eau pour l'irrigation sélectionnées feront l'objet d'essais et de démonstrations expérimentales à une échelle pilote dans des sites choisis en Egypte, au Maroc et en Tunisie, afin d'améliorer leur adaptation au contexte local. Quatre essais pilotes de traitement des eaux usées intégré et de réutilisation / économie de l'eau dans l'agriculture seront mis en place, un pour chaque type d'eaux usées étudiées (municipales, de canal de drainage, agro-industrielles, industrielles). Une analyse SWOT sera mise en place afin de sélectionner les sites pour les quatre essais pilotes et les technologies à y mettre en œuvre, sur la base des scores attribués à chaque technologie d'après (i) leur performance technique, (ii) leur adéquation sociale et technique par rapport au contexte local, et (iii) le résultat de l'analyse du cycle de vie et de l'analyse coût-bénéfice. Chaque usine pilote comprendra un secteur de traitement des eaux usées et un secteur d'irrigation, où des cultures typiques des trois pays cibles y seront cultivées. Chaque usine sera suivie pendant au moins une année.

Stratégies intégrées de gestion des eaux et des terres pour la gestion des eaux usées et de l'eau agricole

Des technologies menant à des stratégies intégrées de gestion des eaux et des terres

MADFORWATER développe et applique plusieurs technologies de traitement des eaux usées, de gestion de l'eau, et d'irrigation pour la réutilisation agricole, afin de contribuer à une gestion efficace des eaux dans les pays africains méditerranéens. Après avoir démontré que les technologies sélectionnées peuvent être adaptées efficacement aux conditions locales, des stratégies intégrées technologiques et de gestion seront proposées pour les étude de cas de bassins fluviaux sélectionnées en Egypte, au Maroc et en Tunisie. Elles seront accompagnées du développement et de l'application d'outils d'aide à la prise de décision ad hoc. Par exemple, une stratégie typique peut inclure la mise en œuvre d'une technologie supplémentaire de traitement des eaux usées pour les effluents d'eaux usées d'une industrie spécifique, afin d'obtenir une qualité d'eau appropriée à l'irrigation qui sera réutilisée avec des technologies d'irrigation efficaces adaptées aux conditions locales.

Cependant, bien que les innovations technologiques fassent partie de la solution, elles ne suffisent pas pour faire face aux défis de la gestion de l'eau actuels et à venir. Les objectifs du développement durable de l'ONU et la stratégie méditerranéenne pour le développement durable soulignent la nécessité d'une utilisation et gestion durables des ressources en eau, ce qui nécessite une stabilisation des besoins en eau, l'amélioration de l'efficacité de l'utilisation de l'eau et la participation et coopération entre les secteurs et les différents niveaux. Pour cela, les initiatives internationales et nationales se concentrent sur l'établissement de politiques de gestion intégrée des ressources en eau (GIRE) et la promotion de la gestion de la demande en eau, y compris l'utilisation d'instruments économiques appropriés pour la gestion de l'eau. De tels instruments encouragent l'efficacité technique et économique de l'utilisation de l'eau et encouragent l'adoption de nouvelles technologies et de solutions innovantes. Cependant, le niveau de la mise en œuvre de ces approches dans les pays méditerranéens varie considérablement. La diversité des paysages naturels, socio-économiques, et institutionnels dans les pays du sud et de l'est du bassin méditerranéen détermine les différents besoins et obstacles relatifs à la gestion de l'eau.

Instruments économiques et stratégies pour la gestion des ressources en eau à l'échelle du basin

Le projet de MADFORWATER établira de nouvelles stratégies de gestion des eaux et des terres. Pour le faire, il s'appuiera sur l'examen et l'évaluation des approches et politiques de gestion de l'eau actuelles et l'utilisation d'instruments économiques dans les trois études de cas choisis en Egypte, au Maroc et en Tunisie. L'élaboration de ces stratégies de gestion des eaux et des terres comprendra l'élaboration d'outils d'aide à la prise de décision visant à intégrer les dimensions biophysiques et socio-économiques de l'utilisation de l'eau et la mise en œuvre des technologies de MADFORWATER dans les bassins. De plus, des instruments économiques et réglementaires seront identifiés pour optimiser une efficace mise en œuvre des technologies sélectionnées.

Évaluation des stratégies en fonction des conditions et priorités locales

Même si certaines technologies et solutions de gestion se révèlent efficaces au niveau technique, la mise en œuvre pratique fait face à des défis souvent accablants, en particulier quand il s'agit des économies émergentes. De tels défis incluent souvent l'absence de systèmes de financement durables et de la coordination intersectorielle requise dans les bassins fluviaux. Pour cette raison, chaque stratégie

proposée sera évaluée de différentes manières, y compris les ateliers de consultation des intervenants, afin de recevoir les commentaires des acteurs locaux sur l'adéquation technique et sociale de celle-ci par rapport au contexte local. Une évaluation complète sera effectuée sur la manière dont chaque stratégie peut réduire la vulnérabilité au stress hydrique dans les bassins versants et améliorer la capacité des acteurs locaux de s'adapter pour gérer les défis liés à l'eau, cela tant dans les conditions actuelles que prévues, compte tenu des aspects climatiques, politiques, et économiques.

Exploitation et promotion des stratégies les plus efficaces

Afin de promouvoir et favoriser la mise en œuvre des stratégies élaborées, des plans d'exploitation seront développés ainsi qu'un catalogue des instruments économiques, des politiques recommandées, des activités de renforcement des capacités, et d'autres mesures importantes sur le plan local.

Exploitation

MADFORWATER vise à aborder l'intégration du traitement des eaux usées et de la réutilisation de l'eau dans le secteur agricole afin de réduire la vulnérabilité de l'eau en Egypte, au Maroc et en Tunisie. Après avoir adopté une approche participative et multidisciplinaire, les partenaires du consortium sont résolument axés sur la réalisation des incidences attendues. À la fin du projet, MADFORWATER fournira plusieurs projets pilotes, stratégies intégrées de gestion de l'eau et des terres, ainsi que des instruments économiques connexes. Sur le long terme, le projet vise à réaliser un certain nombre d'impacts environnementaux, sociaux et économiques associés au traitement des eau usées et au secteur agricole. En outre, MADFORWATER devrait mener à une compétitivité et à une croissance accrues des entreprises de l'UE et des pays méditerranéens africains.

L'exploitation est souvent associée aux activités de diffusion et de communication. Tandis que la diffusion et la communication visent principalement à diffuser le potentiel du projet et à créer un engagement pendant la durée de vie d'un projet, l'exploitation se concentre sur la création d'un impact durable. Des actions d'exploitation appropriées sont donc d'une grande importance pour y arriver. Afin de maximiser la réalisation des impacts de MADFORWATER, les partenaires ont adopté une stratégie d'exploitation spécifique basée sur deux piliers principaux : a) la gestion des connaissances générées, et b) un ensemble d'actions visant à renforcer l'exploitation des résultats du projet.

Le projet MADFORWATER devrait générer jusqu'à quatorze résultats au cours de la durée de vie du projet, la majorité des résultats étant livrés durant les 3ème et 4ème années du projet. Au cours de la mise en œuvre du projet, les connaissances générées seront surveillées et gérées de manière continue, ce qui pourrait entraîner l'application d'outils et de mesures de protection appropriés. En outre, chaque résultat sera évalué sur son potentiel d'exploitation, ce qui donnera une vision claire des avantages, des groupes d'utilisateurs, de la concurrence et du marché, permettant ainsi une meilleure compréhension du potentiel de marché. À la suite de ces évaluations, des stratégies d'exploitation appropriées seront établies. Les résultats exploitables sont soutenus par plusieurs actions adaptées, y compris l'élaboration de plans d'affaires, les ateliers de renforcement des capacités et la formation. Outre les activités d'exploitation de MADFORWATER, un séminaire d'exploitation interne de projet est organisé dans le cadre de la troisième réunion du consortium du projet à Montpellier. Le séminaire d'exploitation se concentrera sur la normalisation en tant que mécanisme approprié pour soutenir l'entrée sur le marché et couvrira également la valeur ajoutée que le modèle d'affaires en toile

Activités de renforcement des capacités

MADFORWATER favorisera le renforcement des capacités des acteurs locaux relatives à la mise en œuvre des technologies sélectionnées, des stratégies et des politiques grâce à un portefeuille solide comprenant formation, transfert de connaissances et activités visant l'accroissement de l'acceptation sociale :

- **2 ateliers de renforcement des capacités relatives aux technologies, stratégies et politiques de gestion de l'eau du projet :** 1 atelier de renforcement des capacités se tiendra dans un pays méditerranéen africain sélectionné en concert avec une conférence scientifique et sera orientée vers différents groupes d'utilisateurs finaux qu'ils soient membres ou pas du Conseil consultatif sur les services tels que les agriculteurs, les utilisateurs de l'eau, les techniciens du traitement des eau usées, les industries productrices des eau usées ; le deuxième atelier se tiendra à Bruxelles et fournira des informations concernant les résultats du projet aux entreprises de traitement des eaux et d'irrigation, aux gestionnaires des usines de traitement des eaux usées et aux autorités responsables de la gestion de de l'eau;
- **1 programme de formation des formateurs de 5 jours sur les technologies d'irrigation / réutilisation de l'eau et sur les technologies de traitement des eaux usées ;** 4/5 formateurs de chaque pays méditerranéens africains cible participeront à ce programme;Post Graduate (MSc and PhD) and early career researcher exchanges between EU and MAC research institutions;

- **4 formations sur le terrain (1 pour chaque usine pilote)** adressées aux techniciens des eaux usées, aux gestionnaires, aux agriculteurs et aux étudiants de doctorat ;
- **Echanges d'étudiants de troisième cycle (maîtrise ou doctorat) et de chercheurs débutants entre les institutions de recherche de l'UE et des pays méditerranéens africains ;**
- **Visites sur le terrain des associations d'utilisateurs d'eau, des zones pilotes, des usines de traitement des eaux usées et des zones agricoles où des technologies d'irrigation innovantes sont appliquées,** organisées parallèlement à l'atelier de renforcement des capacités des pays méditerranéens africains et aux programmes de formation des formateurs ;
- **Promotion des associations d'utilisateurs de l'eau** afin d'accroître l'acceptation des solutions proposées et de transférer les connaissances relatives à la mise en œuvre ;
- **Entretiens et rencontres avec les autorités et institutions locales responsable de la gestion de l'eau,** pour les relier au processus de génération de connaissances du projet et les informer des potentiels et des limites des stratégies proposées.

Réunions précédentes du projet

Réunion de lancement du projet MADFORWATER

Les 15 et 16 juin 2016, les partenaires du consortium du projet MADFORWATER se sont réunis à Bologne pour la réunion officielle de lancement. Quarante-cinq représentants des dix-huit partenaires ont participé à la réunion et ont discuté du plan d'action et du calendrier qui serviront de base au travail qui se déroulera au cours des quatre prochaines années.

La dernière réunion du projet a eu lieu à Agadir, au Maroc, pour analyser les activités du projet mises en œuvre jusqu'à présent et planifier les prochaines initiatives.

La prochaine réunion du projet aura lieu à Montpellier (France), du 3 au 5 juillet, où se tiendra également le séminaire sur la stratégie d'exploitation.

Conseil consultatif de MadforWater

L'adaptation des technologies et des solutions de gestion du projet aux besoins réels et au contexte local des pays méditerranéens africains cibles représente un aspect très important de MADFORWATER. À cet objectif, le projet consultait périodiquement un conseil consultatif constitué principalement de représentants du Partenariat européen pour l'innovation dans le domaine de l'eau PEI, des Initiatives de programmation commune de l'eau IPC, du Programme des Nations Unies pour l'environnement PNUE, de la Plateforme des technologies d'approvisionnement en eau et d'assainissement (WSSTP) et du Conseil national espagnol de la recherche, mais aussi des parties prenantes concernées dans le domaine du traitement, de la gestion et de la réutilisation de l'eau en Egypte, au Maroc et en Tunisie. Ces parties prenantes fournissent périodiquement des commentaires concernant les mesures d'adaptation mises en place et l'acceptation sociale des solutions proposées, afin de minimiser les obstacles à la mise en œuvre et à l'exploitation des technologies et des outils de MADFORWATER. Le premier atelier de consultation des parties prenantes a eu lieu le 16 décembre 2016 à Agadir, au Maroc, et s'est concentré sur l'approche d'adaptation des technologies et des instruments non technologiques (gestion, suivi, formation) et sur l'identification des obstacles et des moteurs pour favoriser la réutilisation des eaux usées traitées pour l'irrigation. 15 représentants du Maroc et 2 de la Tunisie ont participé, en plus des scientifiques représentant plusieurs partenaires du consortium MADFORWATER. L'atelier a permis d'identifier les obstacles au traitement

des eaux usées et à la réutilisation agricole dans les 3 pays cibles, comme suit: le manque de volonté politique pour permettre la coordination et la communication entre les institutions impliquées dans le traitement des eaux usées; la difficulté à identifier l'institution qui assume la responsabilité de la réutilisation des eaux usées; l'absence d'une description claire des rôles; le manque de fonds pour financer le traitement des eaux usées et la surveillance de la qualité de l'eau traitée; l'absence de législation claire sur la réutilisation des eaux usées traitées pour l'irrigation. Les parties prenantes ont généralement convenu qu'un établissement transdisciplinaire doté d'un nouveau mandat axé sur la réutilisation des eaux usées traitées est nécessaire pour surmonter la fragmentation des responsabilités et coordonner toutes les institutions existantes.

MADFORWATER a été présenté à

La Conférence d'AfriAlliance

Le projet a participé à la conférence d'AfriAlliance qui a eu lieu en Afrique du Sud, du 22 au 24 mars. La conférence a duré deux jours et demi, coïncidant avec la Journée mondiale de l'eau. Les groupes d'action d'AfriAlliance ont été présentés ainsi que leurs domaines d'intérêt. La conférence a également mis en valeur les initiatives africaines de recherche, d'innovation, de politique et de renforcement des capacités qui cherchaient des partenaires européens et vice versa ; et a donné l'occasion d'obtenir des informations et des suggestions pour façonner davantage les activités d'AfriAlliance.

La Conférence COP22 à Marrakech

En novembre 2016, le projet a également été présenté lors de la Conférence de la COP22 à Marrakech. Il s'agit d'un événement annuel inclus parmi les conférences de l'ONU sur le changement climatique et organisé dans le cadre de la Convention-cadre des Nations Unies sur les changements climatiques (CCNUCC). De façon plus détaillée, Madforwater a participé à l'événement parallèle de la Commission européenne intitulé "Eau- Energie-Aliments : recherche et innovation pour étudier les liens en Méditerranée", visant à rassembler les acteurs institutionnels et les intervenants en recherche et innovation pour partager leurs points de vue sur les défis et les solutions pour aboutir à une économie à faible intensité de carbone reliée à une gestion durable des ressources. La discussion s'est concentrée spécifiquement sur les doubles défis dans la région méditerranéenne.

252nd ACS National Meeting
organized by American Chemical Society

24 august 2016

GRICU - The 2020 horizons of chemical engineering

13 September 2016 - Anacapri (Italy)

IWA Flotation Conference

Toulouse - 29 september 2016

1ST TUNISIAN-SOUTH AFRICAN INTERNATIONAL WORKSHOP

4-7 November 2016 Tunisia

Water Global Expo
Ecomondo 2016 Fair

8 November 2016 - Rimini (Italy)

ICEST 2017

13 - 15 January 2017

WaterHeroes,
Center for Mediterranean Integration

21/22 March 2017 – Marseilles

Conference presentation in 7th Mikrobiokosmos Conference 2017

7 - 9 April 2017 - Athens, Greece

Industry Water: From Single Use to Integrated Management

20 April 2017 - Bruxelles

The EGU General Assembly 2017

22-28 April 2017 - Vienna, Austria

Attualità dell'Idraulica Agraria e delle Sistemazioni Idraulico-Forestali al cambiare dei tempi

Università degli Studi di Palermo - 4/5 May 2017

Prochains événements où MADFORWATER sera présenté

6th International Symposium on Biosorption and Biodegradation

Biobio2017. 25-29 June 2017,

Praga, Czech republic

9th International Conference on Environmental Engineering and Management

6 – 9 September 2017

Bologna, Italy

22nd Workshop on the Developments in the Italian PhD Research on Food Science, Technology & Biotechnology.

September 20-22, 2017, LIBERA UNIVERSITÀ DEGLI STUDI DI BOLZANO

14th International Phytotechnologies Conference

25 - 29 September 2017

Montréal, Canada

10th World Congress of Chemical Engineering.

1-5 October 2017,

Barcelona, Spain

ICIDC 2017, Internationa Commission on Irrigation and Drainage Conference

8-14 October 2017, Mexico

S2SMALL2017 IWA, Sustainable solution for small water and wastewater treatment systems

22-26 October 2017, Nantes, France

4th International Conference on Microbial Diversity 2017

October 24-26, 2017, Bari, Italy

Ecomondo 2017
Green & Circular Economy.

7-10 November 2017, Rimini, Italy

INTERNATIONAL SYMPOSIUM MICROBE-ASSISTED CROP PRODUCTION OPPORTUNITIES, CHALLENGES & NEEDS.

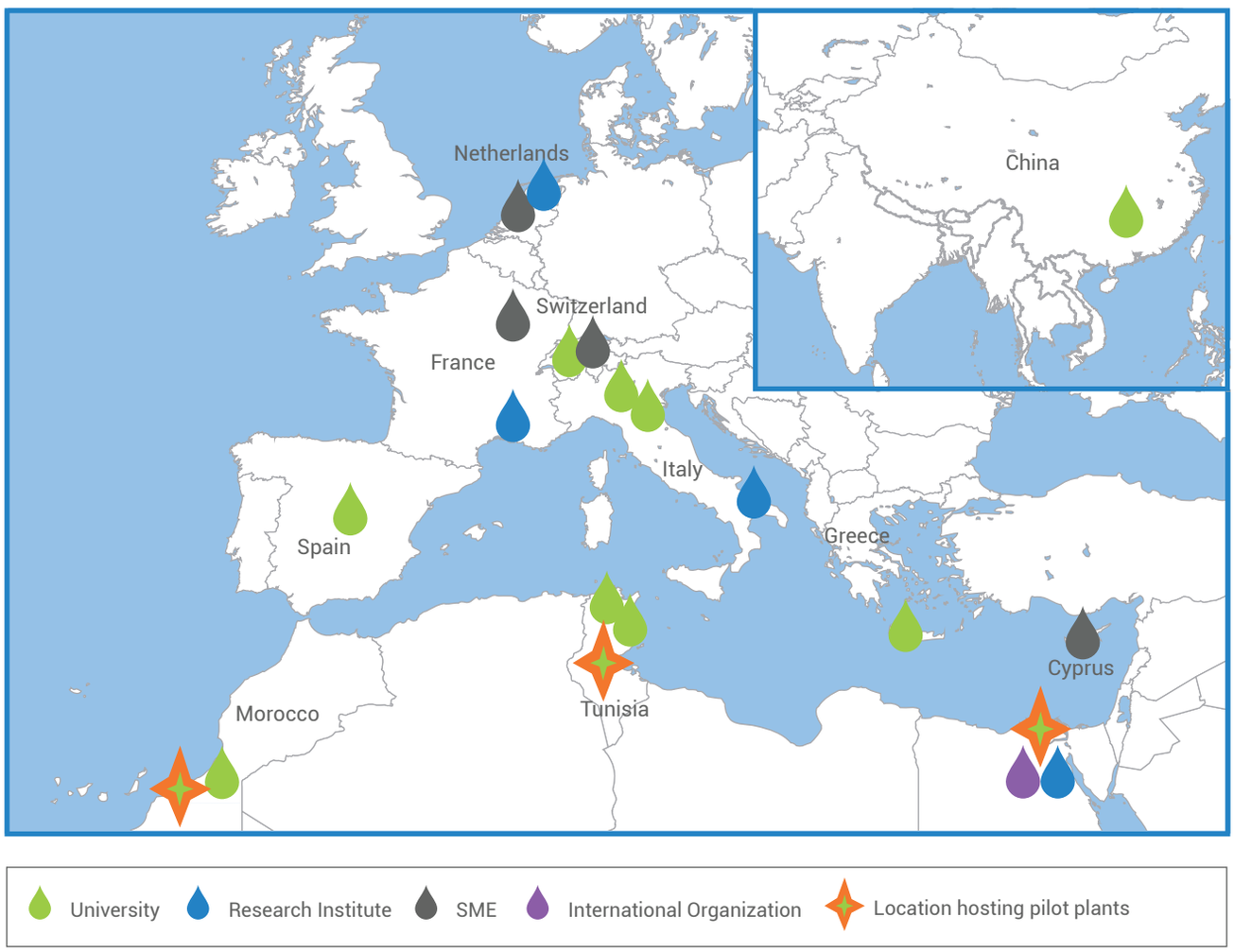
November 21 – 24, 2017 Vienna, Austria

VII Bioremediation Conference.

25-28 June 2018, Chania, Greece

Le consortium de MADFORWATER

Le consortium MADFORWATER se compose de 18 partenaires géographiquement répartis autour de la mer Méditerranée, notamment dans 7 pays européens, 3 pays méditerranéens africains et la Chine. Il comprend 9 universités, 4 centres de recherche, une organisation internationale à but non lucratif (FAO), 1 consultant et expert en matière de marketing, de développement de plans d'affaires et de gestion de l'innovation et 3 experts dans les domaines du traitement des eaux usées et l'irrigation. Les partenaires de MADFORWATER possèdent une expertise multidisciplinaire couvrant les domaines comme le traitement des eaux usées, l'irrigation, l'analyse du cycle de vie des technologies, l'analyse coûts-bénéfices des technologies, l'analyse des vulnérabilités liées à l'eau, la participation des parties prenantes, La gestion intégrée de l'eau, le renforcement des capacités et la conception des plans d'affaires.



Pour plus d'informations sur le projet, visitez le site Web de MADFORWATER à l'adresse:
www.madforwater.eu

Ce projet a reçu un financement du programme de recherche et d'innovation Horizon 2020 de l'Union européenne dans le cadre de la convention de subvention n° 688320

ANNEX 7: Email to stakeholders: MADFORWATER newsletter available in English, French and Arabic!

Dear Reader,
the first newsletter of MADFORWATER, a Horizon 2020 Research and Innovation Action project funded under topic WATER-5c-2015 “Development of water supply and sanitation technology, systems and tools, and/or methodologies” is now available in English, French and Arabic! Download it and share among your contacts.

Chère lectrice, cher lecteur,
Bienvenue au premier bulletin de MADFORWATER, un projet de l’Action de Recherche et d'Innovation Horizon 2020
financé dans le cadre de l'action WATER-5c-2015 sous le thème « Développement de la technologie, des systèmes
et des outils et / ou méthodologies d'approvisionnement en eau et d'assainissement. » L'objectif général de
MADFORWATER est de développer un ensemble de solutions technologiques et de gestion cohérentes pour
améliorer le traitement des eaux usées, leur réutilisation pour l’irrigation, et l’utilisation efficace de l’eau dans
l’agriculture en Egypte, au Maroc, et en Tunisie. MADFORWATER se concentrera sur les eaux usées municipales,
agro-industrielles, et industrielles, ainsi que sur les eaux du canal de drainage du delta du Nil. Le développement et
la validation des technologies seront combinés à la définition des stratégies intégrées de gestion de l’eau, adaptées
au contexte local des bassins hydrologiques sélectionnés en Egypte, au Maroc, et en Tunisie. MADFORWATER,
qui a débuté le 1er Juin 2016, marque son 12ème mois d'activité.
Ce bulletin d’information contient :
1. Une mise à jour sur les activités de MADFORWATER (p.2).
2. Une liste des conférences où MADFORWATER a été présenté ou sera présenté (p.10).
3. Une description de notre consortium (p.13).
Bonne Lecture! Télécharger les ici. Si vous souhaitez recevoir plus d’information ou créer des collaborations, n’hésitez pas à nous
contacter :
Coordinateur : Dario Frascari (dario.frascari@unibo.it)
Co-coordinateur : Giulio Zanaroli (giulio.zanaroli@unibo.it)
Contact de diffusion : Ada Della Pia (a.dellapia@ciaotech.com)
Site Internet : www.madforwater.eu

القراء الأعزاء،
مرحباً بكم في العدد الأول لنشرة مشروع MADFORWATER الذي يتم في إطار برنامج البحث والابتكار أفق 2020 والممول تحت بند خطة المياه 5c-2015 ""تطوير أنظمة إمدادات المياه وتكنولوجيا الصرف والنظم والأدوات و / أو المنهجيات".
ويتمثل الهدف العام من المشروع في تطوير حلول تكنولوجية وإدارية متكاملة لتعزيز عمليات معالجة المياه العادمة وإعادة

استهلاك المياه المعالجة لأغراض الري وتحسين كفاءة المياه في مجال الزراعة في مصر والمغرب وتونس. هذا وسيركز المشروع على المياه العادمة على المستوى المحلي والصناعي الزراعي والصناعي، بالإضافة إلى مياه قنوات الصرف في دلتا النيل. إن تطوير هذه الحلول التكنولوجية وتطبيقها يقترن بتحديد الاستراتيجيات المتكاملة لإدارة المياه بما يتناسب مع الواقع المحلي في بعض الأحواض المائية المختارة في مصر والمغرب وتونس. بدأ المشروع في 1 يونيو/حزيران، وتم تنفيذ أنشطته طوال فترة عمره البالغة 12 شهرا.

تتضمن هذه النشرة:

- عرض لمشروع MADFORWATER
- قائمة بالمؤتمرات التي تم خلالها تقديم المشروع أو سيتم تقديمه.

يرجاء التحميل هنا

نتمنى لكم قراءة ممتعة! لمزيد من المعلومات أو لتنظيم سبل التعاون رجاء الاتصال بنا:

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Best Regards

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