Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution (RHE-MEDiation)

D1.2 – Development collaborative actions with local stakeholders to design the demo-site evolution report

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LIST OF ACRONYMS AND ABBREVIATIONS

EC	European Commission
EU	European Union
GR	Greece
GDPR	General Data Protection Regulations
HE	Horizon Europe
HLS	High-Level Stakeholders
IT	Italy
KS	Key Stakeholders
SHs	Stakeholders
TG	Target Group
TR	Turkey
WP	Work Package
WT	Water Treatment
WWTP	Wastewater Treatment Plant

APPLICABLE DOCUMENTS

[AD1] European Commission, Directorate-General for Research & Innovation, Grant Agreement Number 101113045 The RHE-MEDiation project, 2023

[AD2] RHE-MEDiation Consortium Agreement, version 1.0

EXECUTIVE SUMMARY

D1.2 reports about the strategy established to foster comprehensive collaborative actions with local stakeholders in the context of the RHE-MEDitaion project to acknowledge the proposed development and demonstration at the representative demo-sites and jointly design their evaluation.

The approach adopted in RHE-MEDiation included the organization of three stakeholders' workshops in the three Mediterranean countries to assess the stakeholders' interest about the proposed project's tools and technologies and express the degree of confidence about their suitability to the real case of water pollution scenarios. The workshops engaged stakeholders, providing valuable insights into pollution cleaning strategies and project objectives, and delivered essential guidance for future actions and initiatives. The workshops demonstrated a diverse representation and interest level of the stakeholders whose active engagement emphasized their commitment towards the environmental protection and willingness to be informed about the project follow-up. The potential global benefits of implementing RHE-MEDiation's capillary cleaning of local HOT SPOTs were highlighted. The synthesis across national workshops underscored varying stakeholder priorities and beliefs, emphasizing the importance of tailored approaches for effective stakeholder engagement, that should take into account the country specificities, and the envisaged role and diverse interests of the stakeholders.

The document essentially covered the background information provided, including the stakeholder mapping, a comprehensive analysis of the stakeholders' feedback evaluation criteria and results obtained for each specific site, along with an insightful assessment of their synthesis. The stakeholder mapping showed that stakeholders' real interests aligned well with expectations set by the RHE-MEDiation project's demo-site networking strategy in most circumstances.

1 INTRODUCTION

1.1 Background

Restoring and protecting the Mediterranean and its waters from chemical pollution is one of the most urgent challenges of our time. Today, the entire water cycle, from 'source to sea,' is under unprecedented pressure due to decades of pollution and unsustainable use, resulting in severe degradation of marine ecosystems.

The EU mission to "Restore our Ocean and Water by 2030" in its quest to protect and restore aquatic ecosystems, prevent and eliminate pollution, and make the blue economy climate -neutral and circular through research and innovation, citizen engagement and blue investment has setup four area-based “Lighthouses“ that act as hubs to develop, demonstrate and deploy new solutions, far and wide, and guide us in our journey to restoring our oceans and waters. In particular the "Mediterranean Lighthouses", works towards a healthy and pollution free Mediterranean Sea.

RHE-MEDiation falls under the "Mediterranean Lighthouses," with a focus on regional engagement and cooperation for supporting the work of policymakers. It deploys chemical pollution remediation technologies that will be integrated within existing water/wastewater treatment systems and complemented with mobile and fixed sensing systems to identify and measure the presence of chemical substances in both land and marine waters, being measured data delivered to the EC EMODnet platform to contribute to the Digital Twin of the Ocean. The chance for the proposed solutions to be diffusely employed to contribute to cleaning waters from chemical pollutants before they reach the sea is associated to the demonstrated efficiency of an integrated framework that facilitates upscaling, starting from validation and demonstration at local demo-sites and extending to assessment and appraisal from local to national levels, and further on to EU level.

Embracing an interdisciplinary approach, the project strives to advance the destress capability against chemical pollution in the Mediterranean Sea across three countries (Italy, Greece and Turkey), with a strategic vision to expand its impact to encompass five additional countries of the Mediterranean basin.

The overall project activity is distributed across eight work packages (WPs), and this deliverable will primarily focus on WP1, Task 1.2, development of collaborative actions with local stakeholders to design the demo-site evolution.

WP1's primary goal is to enhance the structure, content, and procedures of the RHE-MEDiation ecosystem as depicted in *Figure 1* with the intention of creating long-term value for its utilization and replication. This objective will be achieved in three key phases. Firstly, a comprehensive evolutionary model will be developed, incorporating technology, business capabilities linked to addressing chemical pollution concerns, social approval, accountability, and governance procedures rooted in a regulatory innovation framework. Secondly, mechanisms will be put in place to facilitate data sharing and export for use in other Mission lighthouses and Blue Parks. Lastly, procedures will be devised to oversee, track, and harmonize the execution of activities, all managed through the Mission Implementation Support Platform. These endeavours are carried out through seven distinct tasks.

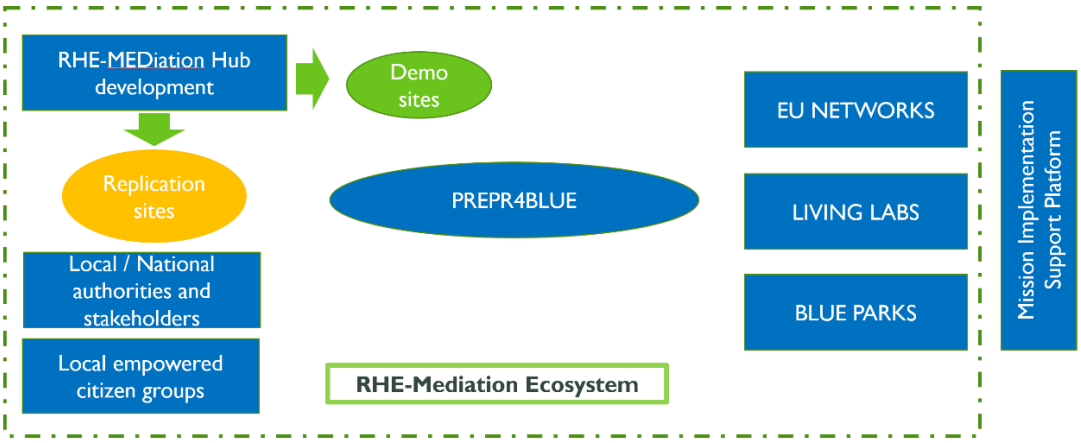


Figure 1:The RHE-MEDiation Ecosystem.

1.2 Aim of Deliverable

In Task 1.1, a state-of-the-art networking strategy was developed that identified the actors to be involved, ensured their participation in the project, and guaranteed that their interests and needs are addressed by the project though co-design activities. To accomplish these objectives, a general stakeholder mapping, a stakeholder engagement, and citizen empowerment strategies were developed in compliance with GDPR regulations. SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis was then used to understand demo-site specific scenarios and recommend clear and attainable goals for the successful implementation of the networking strategy at demo-sites.

In Task 1.2, the primary goal was to collaborate with local stakeholders in designing the demo-site evolution. To achieve this, the consortium employed various approaches to implement the networking strategy developed in Task 1.1, introduced the project to local stakeholders, and generated their interest and active involvement. These activities were carried out with the aim of better understanding the perspectives of local stakeholders regarding the project's relevance, effectiveness, consistency, efficiency, impact, sustainability, and possible obstacles it might face in implementation as well in supporting the EU mission to restore our oceans and waters. The feedback from these interactions will be used to customize the project's activities and, additionally, relay any feedback the project receives about the EU mission it supports to policymakers for further deliberation and use. Furthermore, such two-way interactions between the project consortium and stakeholders will build strong trust that may be useful while expanding the project seamlessly at regional and national levels, in Task 1.3.

Data collected from local stakeholders who represent the target groups in the pent-helix (see deliverable 1.1) and in particular those who participated in an online survey and the first stakeholder workshops held at each demo-site, were used to develop this report (deliverable). The report highlights the evaluation criteria used, the various dissemination activities employed to enhance stakeholders' understanding of the project and its alignment with the EU mission "restore our oceans and waters”, and the different approaches used to gather stakeholders’ perspectives and the analysis of the results.

This deliverable will serve as the standard document for sharing the analysis results of the demo-site evaluation with the EC. Furthermore, parallel activities will be undertaken to disseminate the results of the analysis to local stakeholders for increased participation and building trust in the project and the consortium to improve project outcomes.

1.3 Deliverable structure

Deliverable 1.2 is structured according to the following scheme:

- Section 1 introduces the document.
- Section 2 discusses the necessary background information preceding the demo-site evaluation activity. This includes, a review of the stakeholder group mapping and analysis carried out in Deliverable 1.1 and its re-evaluation based on actual stakeholder mapping and analysis performed by the project with an online survey.
- Section 3 describes the design and structure of the workshops elaborates the evaluation criteria set by the project and the depth of the dissemination and engagement activities carried out for collecting the evaluation results.
- Section 4 details the results of the demo-site evaluation discussed separately for each demo-site.
- Section 5 synthesizes the evaluation results discussed in Section 4 and concludes with recommendations for the project and the EU mission "restore our oceans and waters".

2 STAKEHOLDER ANALYSIS AND MAPPING

Stakeholder analysis and mapping are essential tools for engagement planning, as they help identify the interests and reasons for different actors being actively involved in a project [1].

The identification and categorization of stakeholders into distinct groups facilitate an understanding of the various perspectives, priorities, and roles that each stakeholder brings to the table. This segmentation enables the project team to tailor their engagement strategies and communication approaches to address the specific concerns and interests of each group, thereby fostering a more targeted and effective stakeholder management approach.

This Section discusses the necessary background information of actions performed preceding the demo-site evaluation activity briefly discussed in Sections 3 and 4. In sub-section 2.1 a summary of the stakeholder mapping carried out in Task 1.1 is presented with a focus on Target groups (TG) and high-level stakeholder (HLS) groups, following a scenario that the consortium believed to best represent the RHE-MEDiation project's target for stakeholder engagement. In sub-section 2.3, results of stakeholder mapping and analysis obtained from stakeholders through an online survey is presented and compared to that was developed at strategy level. Moreover, a finial sub-section is added that discusses how stakeholders' data is stored and managed in the project.

2.1 Background mapping

In the course of the stakeholder mapping activity in Task 1.1, the Consortium identified pivotal attributes that make stakeholders suitable for involvement in the RHE-MEDiation project. Some of the prospective stakeholders included:

- Those affected by changes in water quality at the demonstration sites.
- Businesses and industries with an interest in using high-quality effluent for various purposes.
- Organizations promoting education, research, and innovation related to water quality, wastewater plants, the environment, and health, both broadly and specifically.
- Small and medium-sized enterprises (SMEs) and professionals involved in supply and construction for the demonstration sites.
- Local authorities in the municipality where the project is planned.
- Government and non-governmental organizations advocating for environmental and water quality causes.
- Industries considering the adoption of remediation technology for effluent treatment on their premises.

Following the above attributes, a Penta-helix model [2] [3] [4] [5], representing the major target groups namely ,Capital, Businesses, Administration, Civil Society, and Knowledge, was adopted. These target groups were further refined into the high-level stakeholder groups (HLSs) presented in *Table 1*.[1]

[1] More details can be found at D1.1

Table 1 : Target groups and high-level stakeholder groups in the RHE-MEDiation project.

ID.	Capital	Businesses	Administration	Civil Society	Knowledge
A	Water utilities **(CA)**	3rd party contractors that may be involved in the project **(BA)**	Authorities **(AA)**	Citizens (**CSA**)	Universities **(KA)**
B	Wastewater treatment plants owners **(CB)**	that may use the generated effluent **(BB)**	Policy Makers **(AB)**	Civil society organizations (**CSB**)	Research and development centers, including national and local laboratories. **(KB)**
C	Public Investor **(CC)**	Financial opportunity developers **(BC)**			Professional experts, associations, consulting companies **(KC)**
D	Private Investors **(CD)**	that generate wastewater **(BD)**			
E	Financial Institutions **(CE)**	that are impacted by the HOTSPOTS **(BE)**			

The acknowledgment of the fourth category, and in particular citizens, signifies an understanding of the broader community's crucial role in the project's success. By encouraging participants to choose the most appropriate and active role they represent, the project recognizes the multifaceted roles that individuals within the community can play in advocating for and contributing to the project's objectives. This approach ensures that the voices and concerns of the broader public are integrated into the decision-making process, fostering a sense of ownership and shared responsibility for the project's outcomes and impacts.

The active involvement of stakeholders from diverse backgrounds and roles, including representatives from different target groups and the broader community, lays a strong foundation for collaborative efforts in addressing the challenges posed by chemical pollution in the Mediterranean Sea. It reflects a commitment to transparency, inclusivity, and shared responsibility, essential elements for the successful execution of large-scale environmental projects aimed at sustainable and long-term impact.

2.2 Invitation letter to stakeholders

To initiate the contact with the stakeholders at a uniform way across the project, a standard invitation letter was developed at the project level and shared with partners responsible for communication. This letter is presented in *Annex B.*

2.3 First (1st) Surveys for stakeholder analysis and mapping

The invitation letter to stakeholders was followed by an online survey for stakeholder analysis and mapping that was distributed to stakeholders upon their official agreement to join the project. The survey was identical across the three demo-sites and translated into the languages of each -site to facilitate data analysis.

It inquired about each stakeholder's interests, challenges, and needs, as well as the level of involvement / influence they would like to have in the RHE-MEDiation project (i.e., being informed, consulted, or to collaborate). Based on their responses, the project is liaising with them to ensure proper alignment with the target and high-level stakeholder groups, as presented in *Table 1*.

This survey is significant because the stakeholder analysis and mapping, as presented in deliverable 1.1, was conducted ex-ante based on a scenario that the Consortium had collectively agreed upon as the best representation of the RHE-MEDiation project's stakeholder engagement objectives based on the partners knowledge of the attributes of the stakeholders.

Analysis in D1.1. began with some initial assumptions about the level of interest various stakeholder groups might have in the project. We recognize that these assumptions could evolve as actual data became available. Nevertheless, the overarching project objective remained consistent: to utilize all available engagement strategies to maintain a high level of interest among key stakeholders.

2.3.1 First (1st) Survey for Turkish Stakeholders

The 1st survey was sent on **19.09.2023** via e-mail to 50 different stakeholders which return to RHE-MEDiation invitation expressing their interest with contact information of themselves. The analysis of the collected answers from the 1st survey presented as follows. Forty-five (45) answers have been collected at this 1st survey covering most of the main target groups (*Figure 2* and *Figure 3*).

Figure 2: Stakeholders distribution across High-Level stakeholders: First Survey Results from Turkish Stakeholders Reference Group.

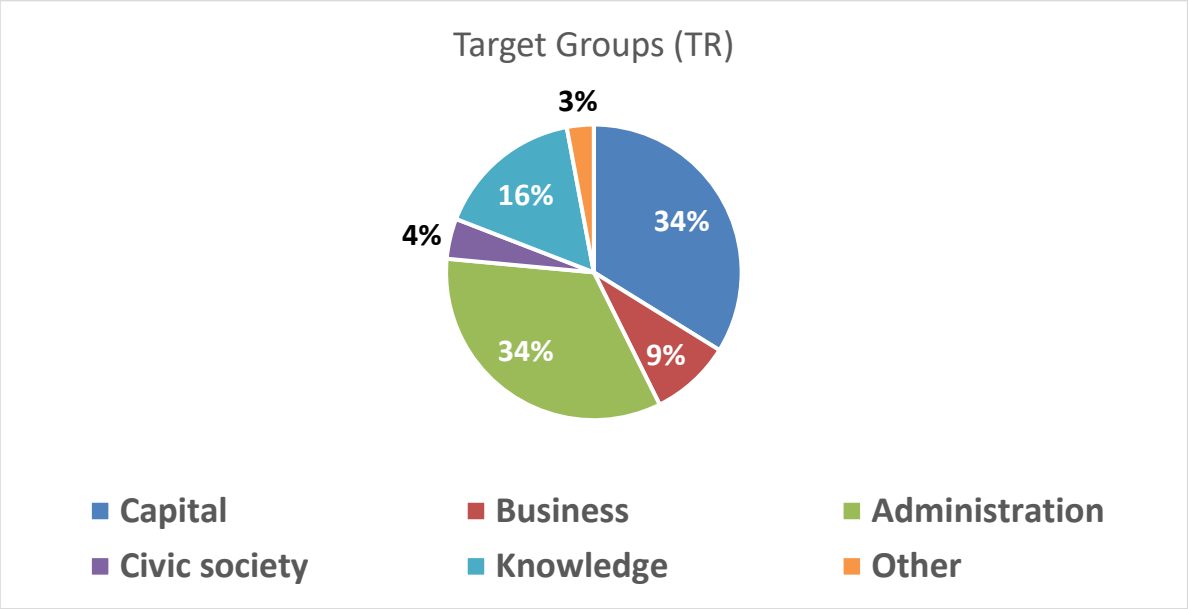


Figure 3: Stakeholders distribution across Target groups: First Survey Results from Turkish Stakeholders Reference Group.

Water utilities, wastewater treatment plant owners, government authorities, policy makers and universities were the highest rate at the participation. When it was grouped, first survey participants were representatives of target groups that capital (23 people-34%), administration (23 people-34%), knowledge (11 people-16%), business (6 people-9%) and civic society (3 people-4%).

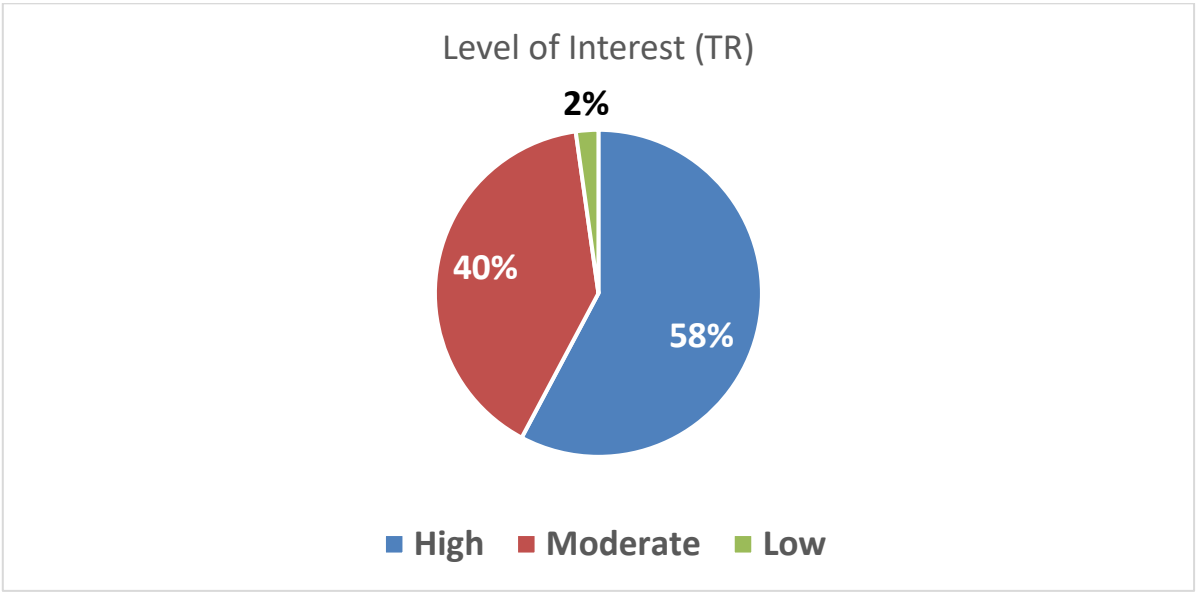


Figure 4: Stakeholders Interest in Joining RHE-MEDiation Project: First Survey Results from Turkish Stakeholders Reference Group.

About their anticipated level of interest, 58 % have answered as high level and 40 % have moderate. In total 98% of the participants have interest above moderate to RHE-MEDiation, which can be concluded as an advantage of the project. It can be noted that more than half of the participant expressing high interest, showing that RHE-Mediation walks through the right direction in Turkey.

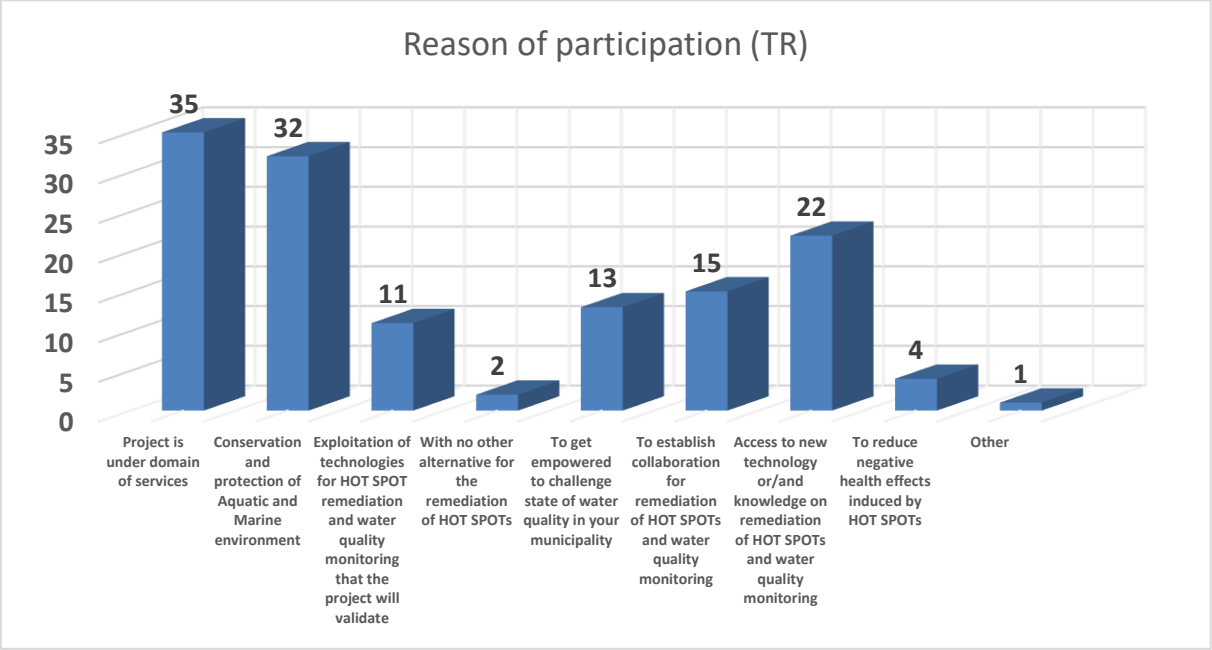


Figure 5 :Stakeholders reason for participation in the RHE-MEDiation project: First Survey Results from Turkish Stakeholders Reference Group.

The participants described their reasons for joining the project mostly as being under domain of services, conservation and protection of aquatic and marine environment and access new technology on remediation of HOT SPOTs.

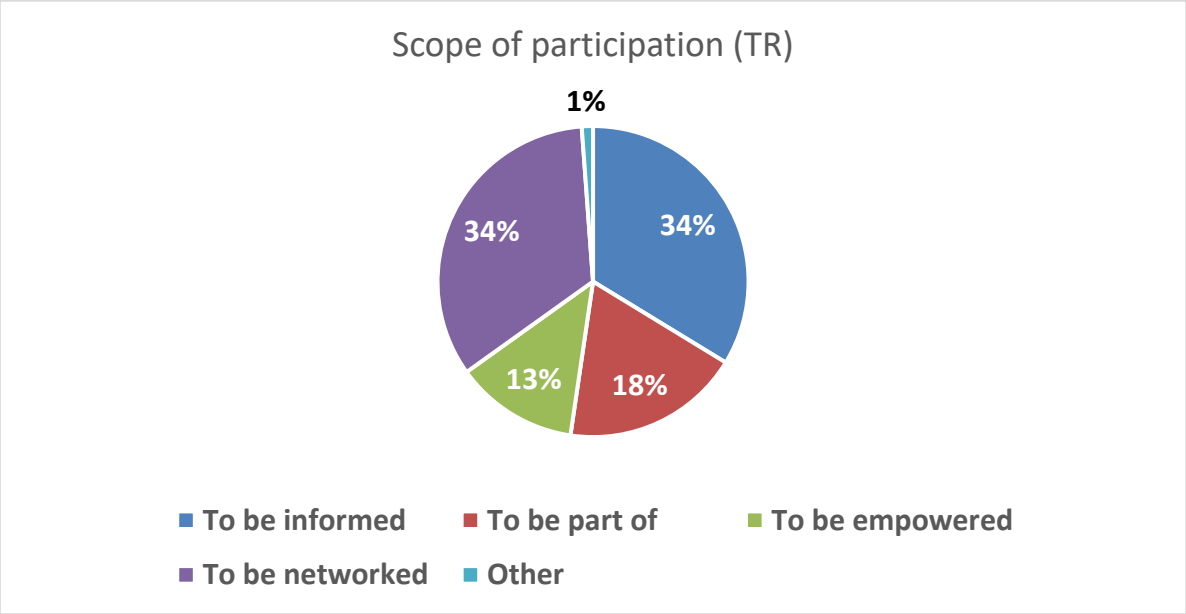


Figure 6 : Scope of participation in the RHE-MEDiation project: First Survey Results from Turkish Stakeholders Reference Group.

With respect to scope of participation, 34% of the participants expressed their desire to be informed and networked, 18% of participants would like to be part of and 13% of participants would like to be empowered during the project.

2.3.2 First (1st) Survey for Greek Stakeholders

The first survey has been designed to enable the Stakeholder analysis and mapping within the framework of the RHE-MEDiation project. It was conducted online from 18th to 28th September. The survey prepared on Microsoft Forms and was send by email.

All together 14 stakeholders answered the survey, the majority (36%) being from 'water utilities'. 'Civil society,' 'Universities/Research' and 'private investors' were also represented (14-15%), whereas Authorities, impacted Business and wastewater generating companies had a minimum representation (7%).

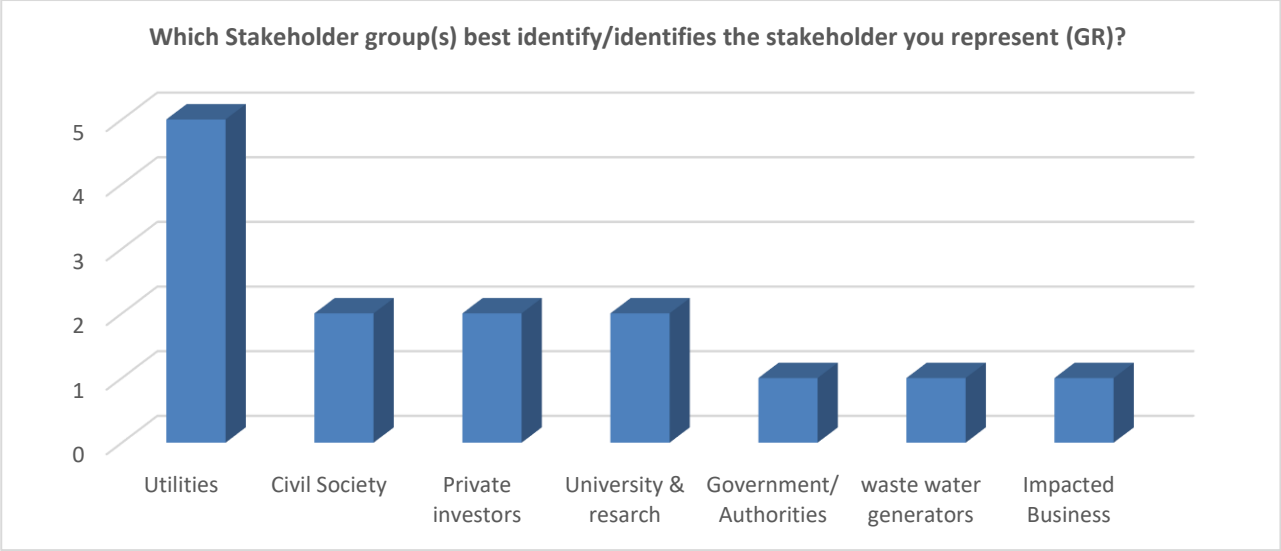


Figure 7 : Stakeholders distribution across High-Level stakeholders: First Survey Results from Greek Stakeholders Reference Group.

Grouped per Target Groups (TGs) the majority (50%) belong to the 'Capital' while 'Business' (15%), 'Knowledge' (14%) and 'Civic Society' (14%) show an even representation; 'Administration' (7%) had the lowest rate for participation.

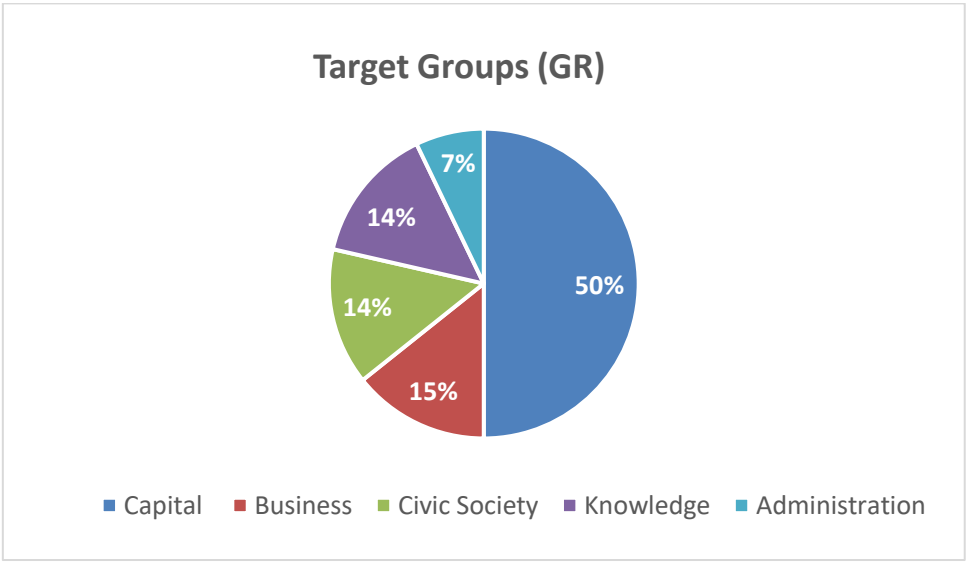


Figure 8 : Stakeholders distribution across Target groups: First Survey Results from Greek Stakeholder Reference Group.

As expected, the ***level of interest was predominantly elevated*** (high = 64%, moderate = 29%). Medium interest was expressed by 'Authorities', 'Citizens', 'Investors' and Professional experts/associations/consulting companies. Interestingly the degree of interest within the 'Citizens' and the 'Investors' was divided with half their representatives expressing high interest and the rest medium.

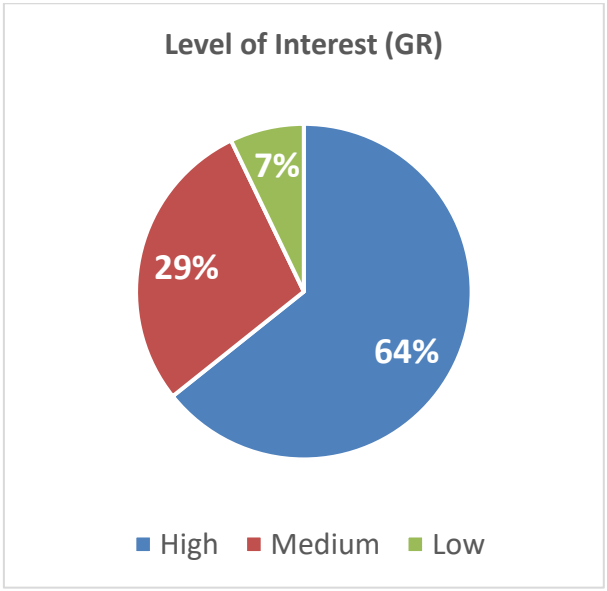


Figure 9 : Stakeholder Interest in Joining RHE-MEDiation Project: First Survey Results from Greek Stakeholders Reference Group.

Grouped the level of interest per Target Groups (TGs), ***the 'Business' and the 'Capital' TGs were the most interested (100% and 71% respectively)***. The 'Civic Society' and the 'Knowledge' TGs were divided with half their representatives expressing high interest and the rest medium.

Participants declared that the scope of their participation was to become informed (72%) understandable so as this was the main scope of the survey.

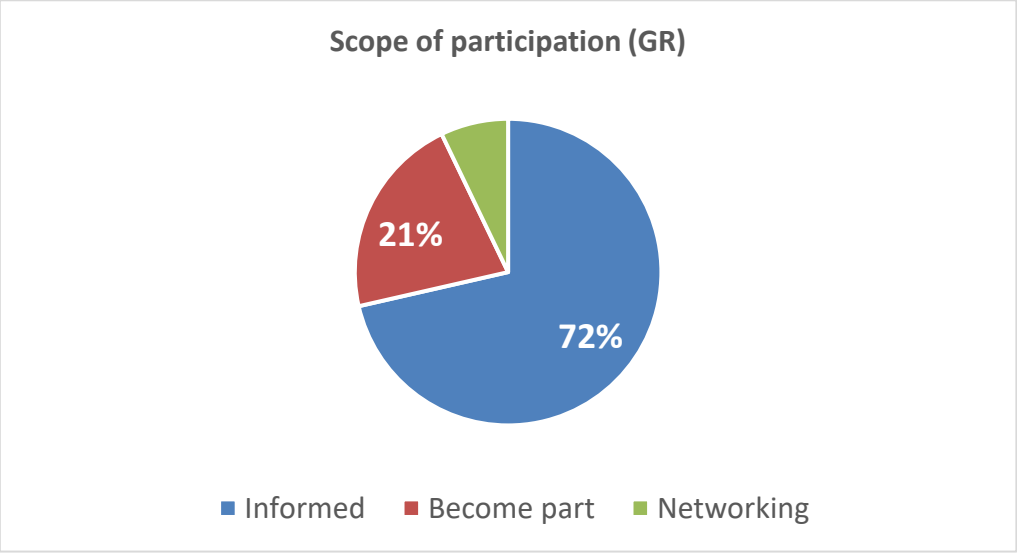


Figure 10 : Scope of participation in the RHE-MEDiation project: First Survey Results from Greek Stakeholder Reference Group.

The reason of the participation showed a variation among the participants with 'Conservation and protection of Aquatic and Marine environment' and 'Project is under domain of services' getting the highest scores demonstrating the range of interest. Interestingly the reasoning appears not to be related to the stakeholder group.

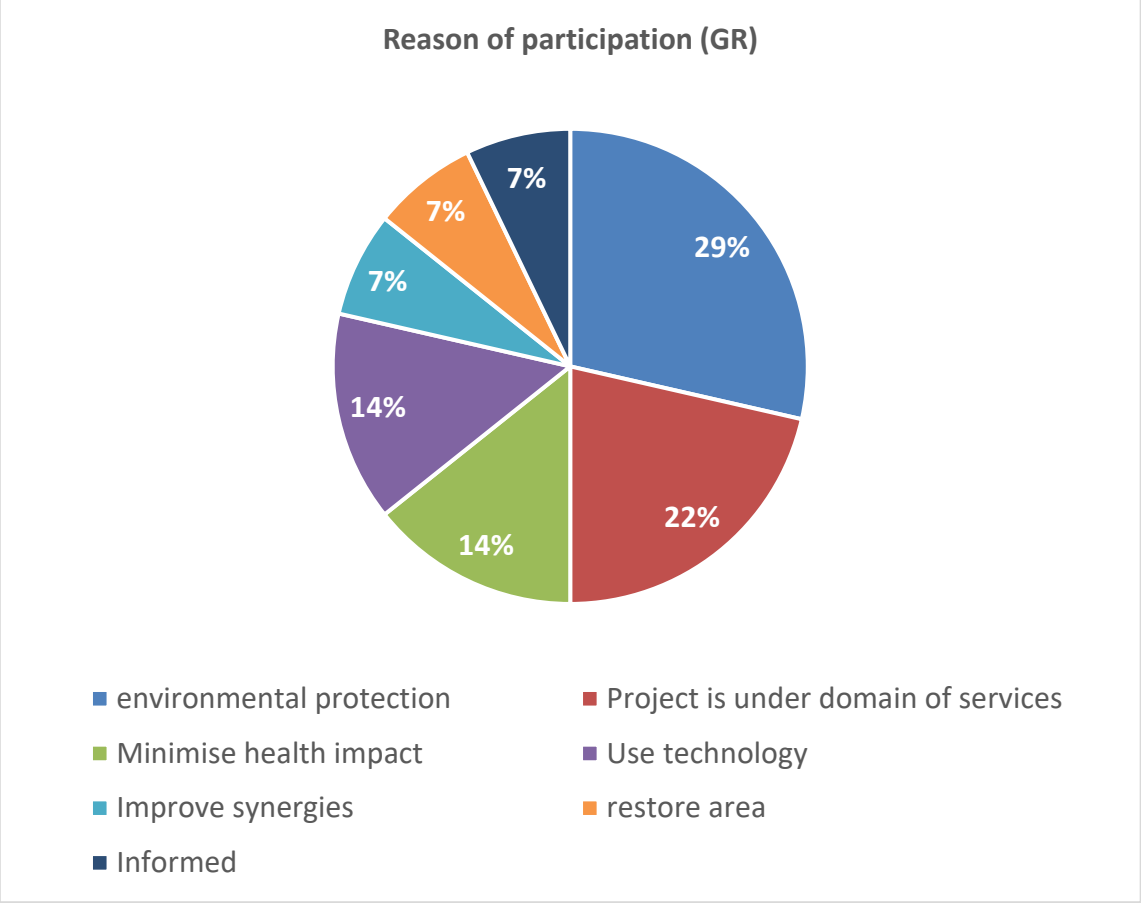


Figure 11 : Reason of Stakeholders participation in the RHE-MEDiation project: First Survey Results from Greek Stakeholders Reference Group.

2.3.3 First (1st) Survey for Italian Stakeholders

The first survey was sent out together with the invitation letters for participation in the first stakeholder workshop, and data were collected in the following weeks. The survey was prepared on Microsoft Forms and sent via e-mail to the stakeholders.

Interest in the project, with the completion of the first questionnaire, was shown by 70% of the participants. However, the degree of interest varied among the groups (universities and polytechnics at 83%, and the authorities and policy makers at 30%).

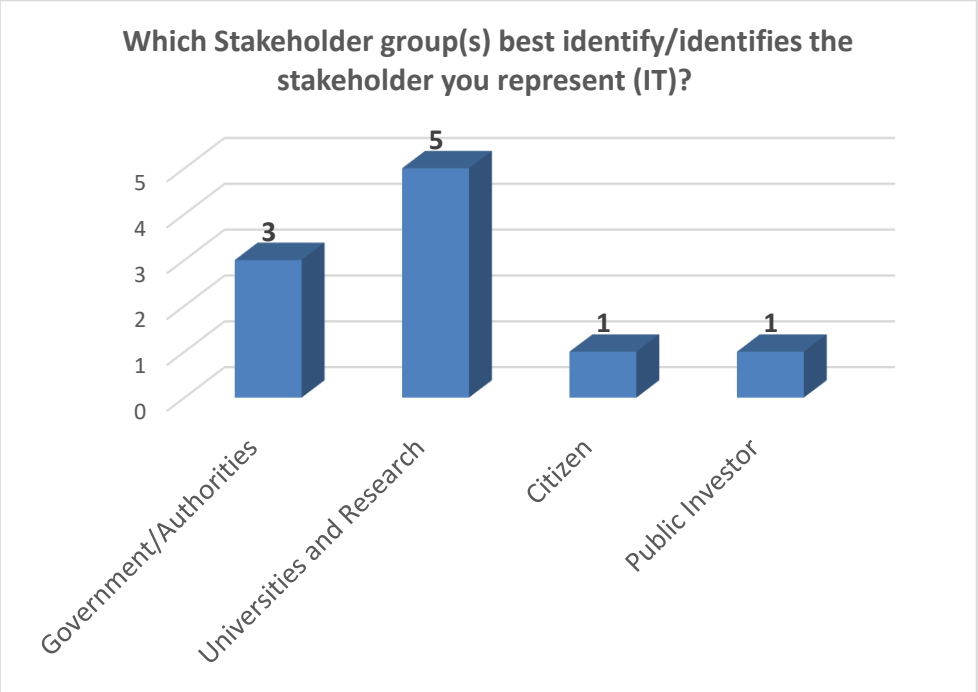


Figure 12 : Stakeholders distribution across High-Level stakeholders: First Survey Results from Italian Stakeholders Reference Group.

Grouped per Target Groups (TGs) the majority of the stakeholders belong to 'Knowledge' (50%) and 'Administration' (30%) with the rest showing an even representation.

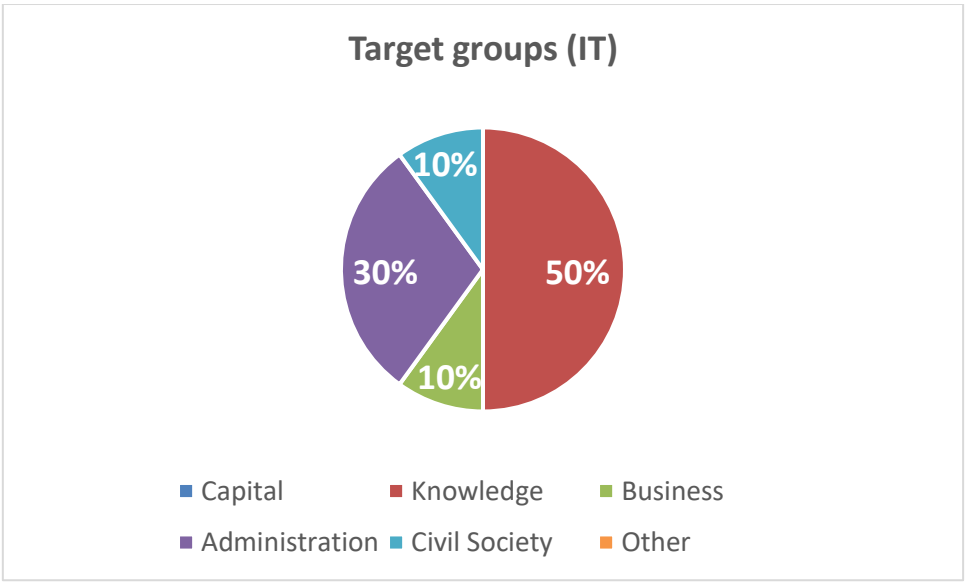


Figure 13 : Stakeholders distribution across Target groups: First Survey Results from Italian Stakeholder Reference Group.

As expected, the level of interest was high (high = 70%, moderate = 30%). Medium interest was expressed by some members of the 'authorities' and 'University and Research' groups.

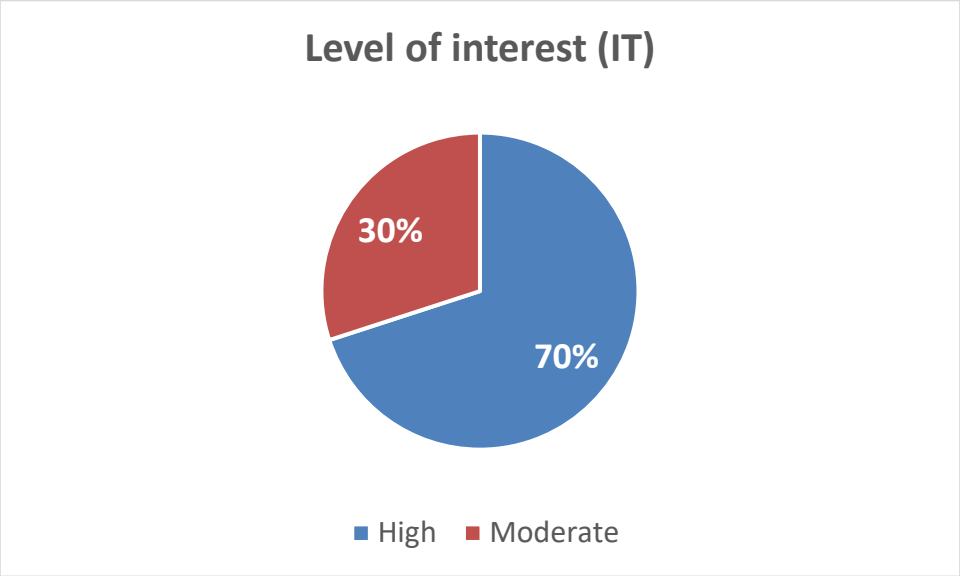


Figure 14: Stakeholders Interest in Joining RHE-MEDiation Project: First Survey Results from Italian Stakeholders Reference Group.

Grouped by target group (TG), the TG 'Authorities' expressed 67% moderate and 33% high interest; the TG 'Knowledge' 80% high and 20% moderate; 'Civic society' and 'Business' 100% high.

Participants stated that the objective of their involvement was mainly to participate (33%), but also to have the opportunity to network and to be informed (27%); only 13% stated that they thought this could be an opportunity for empowerment.

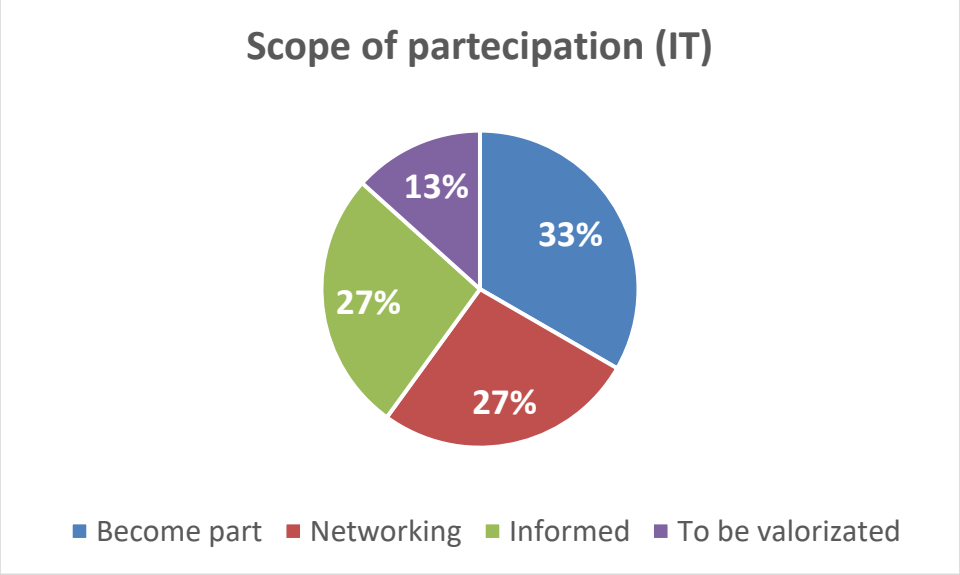


Figure 15 : Scope of participation in the RHE-MEDIation project: First Survey Results from Italian stakeholders Reference Group.

The prevailing motivations for participation were for all categories "to contribute to the conservation and protection of the aquatic and marine environment" and "to realise collaborations for HOT SPOT remediation and water quality monitoring".

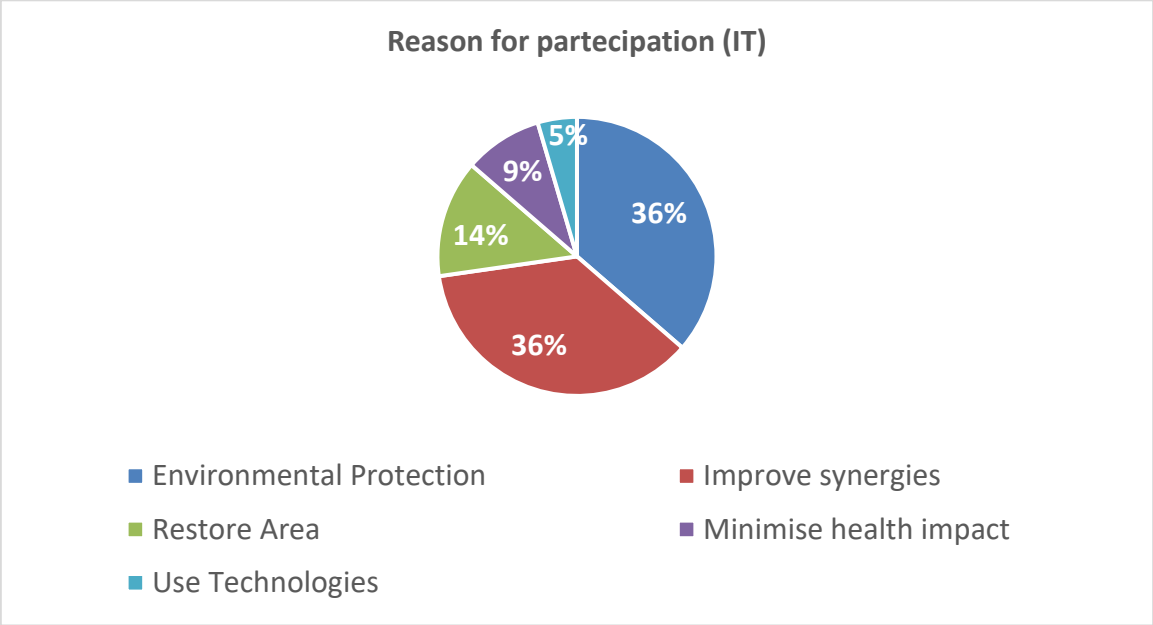


Figure 16 : Reason of Stakeholders participation in the RHE-MEDiation project: First Survey Results from Italian Stakeholders Reference Group.

2.3.4 Strategy vs primary data (Qualitative stakeholder mapping)

As a means of comparing the anticipated outcomes during the development of the demo-site networking strategy (as set in D1.1) with the actual data now at hand, two results from this survey are reported here. Section 4 provides a comprehensive discussion of the survey results from a quantitative point of view to aid the demo-site evaluation. Also, the results presented in *Figure 17 and Figure 18* should not be taken as to represent all stakeholders of RHE-MEDiation, they rather represent those that filled the 1st survey.

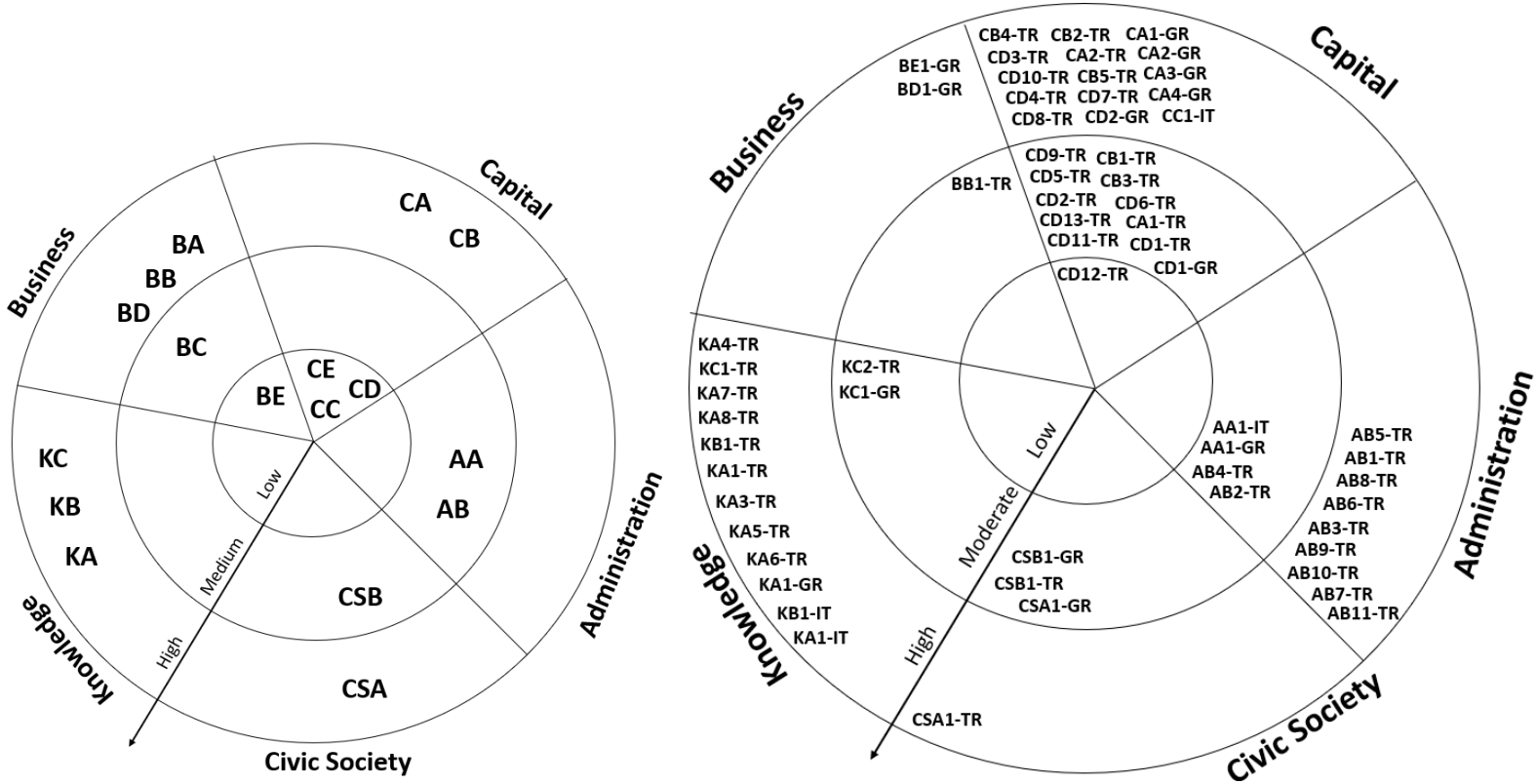
*Figure 17*a, shows the anticipated level of interest for the High-level stakeholders whilst *Figure 17*b presents the actual interest level of key stakeholders as identified from the online survey. The Stakeholders are represented by the letters of the target and high level group (as shown in *Table 1*) in *Figure 17a* followed by a number denoting their location in the RHE-MEDiation project's database and the country code of the demo-site they are part of (IT=Italy, GR=Greece, TR=Turkey). See the stakeholder ID column in Annex A. These relations allow a direct qualitative comparison between the two figures. For example, the code CA1-TR denotes the no. 1 representative under water utilities high level stakeholder group in the Turkish demo-site.

In the Capital target group, except for the water utilities and WWTP owners HLSs (in which a high interest was anticipated), a lower interest was expected for the other HLS (i.e., Investors and Financial Institutions). This was somewhat predictable since, at this stage, the project lacked exploitable results, which typically trigger investors' interest. Against these odds, a moderate level of interest was observed from these HLSs. Similarly, survey results for the administrative target group revealed a heightened level of interest among policy makers compared to what was initially anticipated during the planning phase.

Involvement of citizens and civil societies in the survey was limited, however the data collected indicate that actual interest fell within the expected range. The Knowledge target group exhibited a high level of interest, as anticipated during the strategy development. Nevertheless, the project will need to make additional efforts to boost the interest in this target group. For the Business target group, the participation of various businesses in the survey was limited, but the collected data showed that interest aligns with expectations.

In *Figure 18*, the survey findings indicate that stakeholders exhibited a range of engagement preferences, with **"informed"** and **"be part"** being the most frequently selected options. The **"consult"** category was not originally included in the survey, but it is being introduced here due to a noteworthy observation: stakeholders who expressed a high level of interest in the survey often chose to be **"informed"**. Consequently, these selections have now been reclassified under the **"consult"** category. These stakeholders are those represented with red.

Notably, for High-Level Stakeholders (HLS), particularly investors and financial institutions, their expected engagement choice was "informed". However, the survey results suggest that stakeholders which belong to this group are open to collaborating with the project. On the contrary, some water and wastewater utilities and policymakers requested the "informed" level of engagement. The project should engage with these stakeholders to enhance their participation in the project.

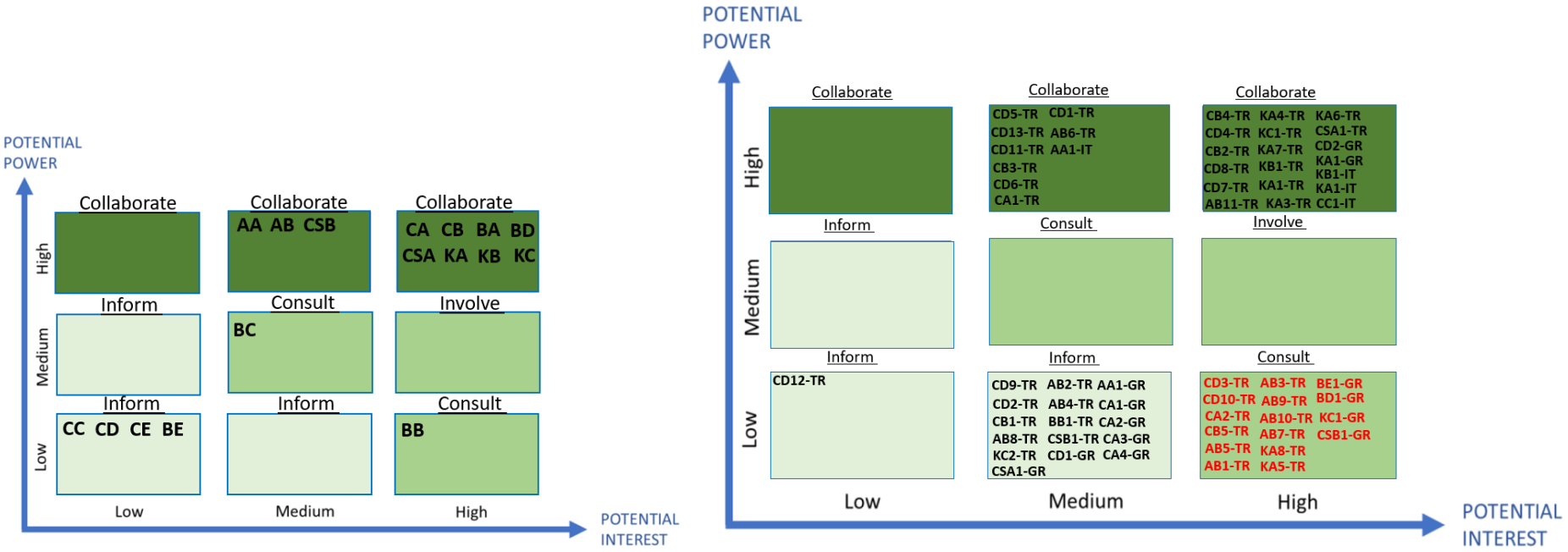


a) Anticipated interest level of HLS

b) Identified interest level of key stakeholders in the first survey

Figure 17 :The anticipated level of interest by HLS (right) and Identified interest per key stakeholders in the RHE-MEDiation project.

Note: The stakeholders are represented by the letters of the target and high level group (as shown in *Table 1*) in *Figure 17*a followed by a number denoting their location in the RHE-MEDiation project's database and the country code of the demo-site they are part of (IT=Italy, GR=Greece, TR=Turkey). See the stakeholder ID column in Annex A. These relations allow a direct qualitative comparison between the two figures.



a. Anticipated Influence interest matrix of HLS

b. Identified Influence interest matrix of key stakeholders the first survey

Figure 18 :The anticipated Influence interest matrix by HLS (Left) and Identified Influence interest matrix by key stakeholders (Right) in the RHE-MEDiation project.

Note: The stakeholders are represented by the letters of the target and high level group (as shown in *Table 1*) in *Figure 18*a followed by a number denoting their location in the RHE-MEDiation project's database and the country code of the demo-site they are part of (IT=Italy, GR=Greece, TR=Turkey). See the stakeholder ID column in Annex A. Red stakeholders represent those stakeholders with high interest but selected to be informed option in the survey. They are Reclassified here under the "consult" category. These relations allow a direct qualitative comparison between the two figures.

2.4 Managing the stakeholders' network

Whenever a key stakeholder at a demo-site joins the RHE-Mediation project, all relevant information pertaining to their interest and the engagement level would be saved in a database managed by local partners. All information is saved in compliance to GDPR, under a uniform, and standardized format harmonized across all demo-sites.

As far as any stakeholder personal data is involved, in accordance with the RHE-MEDiation Consortium agreement [AD2], It's kept with demo-site partners where the data is collected and is not shared among the Consortium. Only data that does not pertain to "Private data" will be shared among partners or stored at the project's repository. *Figure 19* describes the direction of stakeholder data flow in the RHE-MEDiation project. In the diagram "Output" refers to relevant data that excludes private data of a stakeholder.

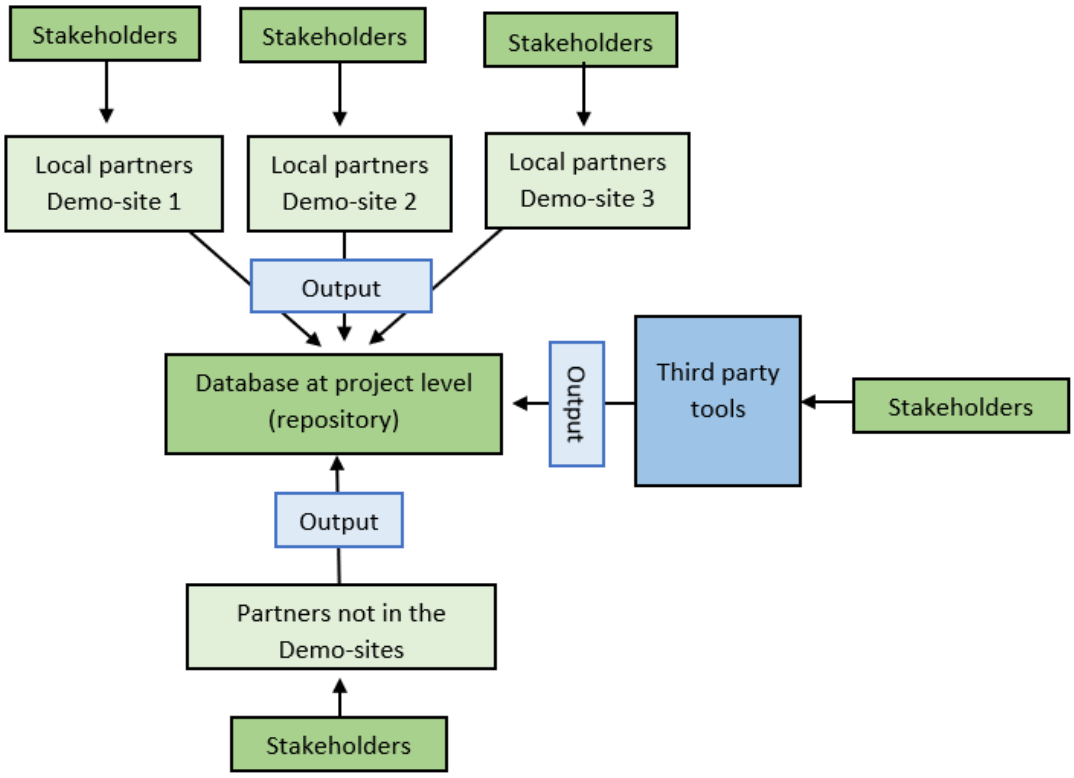


Figure 19 :Direction of Stakeholders data flow in the RHE-Mediation project.

3 NATIONAL WORKSHOPS

The criteria for the demo-site evaluation need to be prepared before initiating the collaborative action with local stakeholders to design the demo-site evolution report. Additionally, the project understands that the better-informed stakeholders are, the more effectively their feedback about the project and the EU mission it supports can be captured.

The commitment to conducting periodic assessments throughout the project's lifecycle represents a proactive approach to tracking changes in stakeholders' perspectives over time. By comparing these assessments to the initial findings, the project team can gain valuable insights into the evolving dynamics and perceptions surrounding the project. This process not only allows for the identification of any shifts in stakeholder attitudes but also provides an opportunity to assess the impact of the implemented strategies on stakeholder engagement and support.

By consistently evaluating stakeholders' perspectives and adapting strategies based on the findings, the RHE-MEDiation project can enhance its effectiveness and foster a more inclusive and collaborative approach towards achieving its objectives. This comprehensive approach to stakeholder engagement is instrumental in ensuring the project's success and long-term sustainability.

By prioritizing the active participation of stakeholders, the project demonstrates a commitment to inclusivity and collaboration, essential for the successful implementation of initiatives with far-reaching environmental impacts.

In this regard, this Section will briefly discuss the evaluation criteria used in the demo-site assessment, along with the extent of the dissemination and engagement activities carried out to gather the evaluation results.

3.1 Setting the RHE-MEDiation Workshops

3.1.1 Workshops Objectives

The aim of the 1st workshop was to introduce the project to stakeholders and involve them in co-design activities, establish social empowerment, and share accountability among stakeholders regarding the remediation needs, governance, and the evolution of the demo-sites. In this regard, the main objectives sought were:

- To present the RHE-MEDiation services and products to targeted End Users and Stakeholders.
- To present the requirements of the RHE-MEDiation Case study sites, regarding Challenges and methodology, RHE-MEDiation Technology and setting up data monitoring of chemical contaminants.
- To discuss with Stakeholders and Scientific Community the social dimensions of water quality monitoring and management and clarify our common aims and goals.
- To establish a RHE-MEDiation Stakeholder Network, allowing input from Stakeholders and Competent Authorities and get feedback from them through tailed questionnaires and round table discussions.
- Establish the social empowerment and shared accountability among stakeholders regarding the remediation needs, governance, and evolution of the demo-site.

Each workshop was comprised of introductory presentations, round tables with pre-set question and answers and online Survey for the demo-site evaluation.

3.1.2 Agenda

Once the Consortium established a common agenda, each demo-site created their own customized agenda to cater to the specific stakeholders they expected in the workshop. These demo-site specific agendas, written in the local language, can be found in Annex C along with an invitation letter sent for stakeholders to participate in the Workshop. *Table 2* presents the core elements of the general Workshop agenda agreed by the Consortium.

Table 2: The general Workshop agenda agreed by the Consortium.

	RHE-MEDiation project **1st workshop general Agenda**		
No	**Time (min)**	**Topics**	**Responsible**
1	10	Welcome and introduction to RHE-MEDiation project (EN)	RINA-C
2	10 per demo-site	The workshop host's demonstration site was presented in the local language, while the other demo-sites, participating online, delivered their presentations in English.	EYDAP & HCMR, CNR, TUBITAK MAM & YURT MUH
3	15	*Networking Strategy for RHE-MEDiation (EN) was presented in local language.*	RINA, EYDAP & HCMR, CNR, TUBITAK MAM & YURT MUH
4	60	Q&A with Stakeholder's Reference Group (Round Tables) to be finalized with specific questions using local language.	RINA-C, EYDAP & HCMR, CNR, TUBITAK MAM & YURT MUH
5	15	Final Survey to be completed in real-time using local language.	RINA-C, EYDAP & HCMR, CNR, TUBITAK MAM & YURT MUH
6	-	Other events particular to a demo-site that use local language.	EYDAP & HCMR, CNR, TUBITAK MAM & YURT MUH

As can be observed from the depth of the agenda introduced in *Table 2*, this activity was targeted at increasing the local stakeholder's knowledge about the project before the demo-site evaluation was performed using different channels.

3.1.3 Presentations

As indicated in *Table 2, t*he presentations in the workshop were aimed at increasing the knowledge of local stakeholders about the project before the demo-site evaluation was carried out.

3.1.4 Questions and Answers for Round Tables

This activity involves a two-way interaction between the stakeholders and the workshop organizers. Stakeholders' seats were arranged ensuring that the members of the different target groups were represented at each table (where feasible). This approach created conversations dynamic and ensures comprehensive answers.

The goal is to assess stakeholders' current perspectives on the project's feasibility and its contribution to the EU mission. Through this roundtable discussion, we aim to comprehend our stakeholders' stances and later formulate actions to encourage their active involvement in the project.

At each table, the event was planned in three sessions of Questions and Answers.

In the first session, Questions addressing general understanding of the problem by the responder were discussed. The questions posed in this session were:

- **A1.** Regarding the technical feasibility and associated costs of 50% pollutant removal from the sea by 2030, as recommended by the EU mission “restore our oceans and waters”, do you have faith in the accuracy of this message?
- **A2.** What is your feeling about the dimension of the chemical pollution of waters? Do you believe that is represent a worldwide problem, is it more at national scale, or do you think it is more a local issue?
- **A3.** Do you have confidence in the ability of local authorities to take charge of chemical pollutants removal from water by improving the regulatory framework and adopt technology solutions (like the one proposed in the RHE-MEDiation project).
- **A4.** Do you believe people could be more thrustful about the opportunity to remediate from polluted areas if having full transparency about chemical pollution data measured in the water?

In the second session, questions addressing specific understanding of the RHE-MEDiation potential impact by the responder was discussed. The focus was the trust stakeholders have on the RHE-MEDiation technology and whether the role of stakeholders was clearly defined by the project. The questions were:

- **B1.** What are your thoughts on the action proposed by the RHE-MEDiation project? Do you believe that the technology alone has the potential to mitigate the issues in the HOTSPOTs, or do you think additional upstream measures need to be incorporated into the action?
- **B2.** Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?
- **B3.** What should the role of each stakeholder be for the project to succeed and have a lasting impact on the Mediterranean basin including and beyond the project completion period?
- **B4.** What should be the role of Citizens for the project to succeed and make its impact over the Mediterranean basin including and beyond the project completion period?

In the third session, questions focusing on capturing the perspective of the local content and potential upscale effects by the responder were put for discussion and evaluation were deliberated. The procedure of the session (except for C5 which was an open discussion), called for all answers to be registered and then the group would choose the three benefits/challenges/consequences considered most important. The discussion points were:

- **C1.** What are the potential benefits at local level of any chemical pollutants cleaning action (like the one promised by RHE-MEDiation project) for the People and Organizations in the area around the demo-site?
- **C2.** What are the perceived consequences in the long term if any action regarding the chemical pollutants in waters is not taken very soon in the area around the demo-site?
- **C3.** What are the potential challenges you may forecast during scaling up of the RHE-MEDiation cleaning process to the specific demo-case or other states in the Mediterranean basin?
- **C4.** What are the potential global benefits at Mediterranean level you may imagine by enabling capillary cleaning of all identifiable local HOT SPOTs through the technologies the RHE-MEDiation project is promoting?

C5. Do you believe that enabling local measurements of chemical pollutants in the water and making them available through a broader access database platform could promote a better awareness of this issue and strongly stimulate people to turn behaviour?

The questions and discussion points above constitute a significant part of the demo-site evaluation criteria established by the project and shared with stakeholders for co-designing the demo-site evolution report. The stakeholders' evaluations were collected in hard copy, and the analyses are presented in Section 4.

3.1.5 Online Survey for the demo-site evaluation

As indicated in *Table 2*, an online survey was conducted right after the round table event. However, Workshop participants were also allowed to fill the surveys up to some days after the workshop. Building on the roundtable discussions, the survey has been conceived to gain real-time insights into Stakeholders' perspectives on the project's feasibility and its alignment with the EU mission "restore our oceans and waters." The questions followed those posed during roundtable discussions in a more 'synthetic' form:

Q1. Country the stakeholder belongs.
Q2. Which Stakeholder group(s) best identify/identifies the stakeholder you represent?
Q3. Do you trust the accuracy of the EU mission "restore our oceans and waters", goal to achieve 50% pollutant removal from the sea by 2030?
Q4. How do you perceive the extent of chemical pollution in waters?
Q5. Do you believe local authorities can effectively manage chemical pollutant removal from water through regulatory improvements and technology solutions like RHE-MEDiation proposes?
Q6. Would transparency in chemical pollution data make people more confident in the remediation of polluted areas?
Q7. Can RHE-MEDiation's remediation technology contribute to pollution-free HOTSPOTs?
Q8. Do you think additional upstream measures (e.g., replace with less pollutants solution) are needed alongside RHE-MEDiation's technology to address HOTSPOT issues?
Q9. Can you suggest alternative solutions for addressing water quality pollution in HOTSPOTs aside from what RHE-MEDiation proposes?
Q10. Did the workshop provide a clear understanding of your role in RHE-MEDiation's lasting impact on the Mediterranean basin and beyond, during or after its completion?
Q11. What is your opinion on RHE-MEDiation's networking strategy?

The evaluation of the results of the stakeholder responses are discussed for each demo-site in Section 4.

3.2 Dissemination kit

3.2.1 Name badges

These were prepared for both participants and organizers. The badge includes the names of the demo-site partners who are organizing the workshop, the individual's name, their level of participation, and the official RHE-MEDiation project logo. Additionally, a shortened version of the EU disclaimer and the "restore our oceans and waters" EU mission logo, has been embedded in the badge. Refer to Annex D for the specific designs of the name badges.

3.2.2 Leaflets

The Project leaflet presents a general description to the stakeholders. The information includes the concept behind the project, the mission it supports, the methodology it follows, and the expected outcomes. Refer to Annex D to find the Leaflet.

3.2.3 Poster/Roll-up banners

In total, in either poster or roll-up form, the following five information were presented at the workshop, each presenting a different set of information to stakeholders. These materials, in poster format are presented in Annex D.

1. **General description of the project**: This is a direct conversion of the Leaflet to either a poster or a roll-up. Its purpose was giving a general information about the project to stakeholders.
2. **The Microalgae based Photobioreactor**: This material discusses the removal capacity of algae in relation to pollutants indicated in the GA, as well as, how the system is designed and integrated into existing water and wastewater systems.
3. **Supplementary technologies in the RHE-MEDiation technology basket**: This material is designed to provide in-depth information to stakeholders about the various technology outcomes in the RHE-MEDiation technology basket, other than the microalgae-based photobioreactor which has its own poster or roll-up. The different technology outcomes presented in this material were:
    - Development of smart integrated measurement points for monitoring of real chemical pollution cases.
    - Unregulated chemicals characterization protocols for replication purposes.
    - Data integration with ocean and water digital twins.
    - Input to Water Framework Directive and Marine Strategy Framework Directive.
4. **Demo-site specific information**: The three demo-sites in Greece, Italy and Turkey are presented together.
5. **Stakeholder life-cycle**: This material presented the stakeholder engagement life cycle and the citizen empowerment model.

3.2.4 Certificates

Following the conclusion of each workshop, participants were presented with a certificate, personally signed by the demo-site partner/s responsible for organizing the event.

4 RESULTS OF THE DEMO-SITE EVALUATION

In the context of RHE-MEDiation project, aimed at decreasing the Mediterranean Sea's stress from chemical pollution, three workshops organized in October 2023 by 'demo-case' partners; EYDAP in Greece, TUBITAK in Turkey and CNR in Italy, being supported by HCMR, YURT-MUH and RINA-C respectively.

The on-site Workshops were scheduled to introduce the project and its strategy to local stakeholders. The primary objective was to foster stronger connections between RHE-MEDiation Vision and Stakeholders, thereby optimizing the project's outcomes. Moreover, the meetings aimed to enhance ***Capital, Business, Administration, Knowledge and Civic Society*** understanding of RHE-MEDiation project, enabling them to evaluate its relevance, effectiveness, coherence, efficiency, impact, sustainability, and potential obstacles.

4.1Turkish Workshop on 2nd of October 2023

Invitation of stakeholders

The RHE-MEDiation hub approach creates an integrated framework, starting with pilot applications at the local level, extending to evaluation and implementation from local to national level and then to the EU level. During the project period, it is aimed to ensure cooperation between the project team and stakeholder institutions, information transfer, consultation, involvement of stakeholder institutions in the project and ultimately the formation of specialized groups on the subject.

In order to achieve this purpose for the Turkish demo site an official invitation letter sent to 75 different stakeholder organisations representing 5 main target groups on 15.08.2023 via official posting, official e-posting, fax, e-mail. It was preferred to send the invitation in an official way by considering past experience of the TUBITAK team. In Turkey it is more effective to inform first the head of the organisations then to sustain spread the information from up to down in the organisation. It was anticipated that the experts appointed by their chair will get the duty of being part of the project. 50 organisations sent their acceptance to our invitation by e-mail (as requested) together with assigned two expert names and contact information for future communications.

Figure 20: RHE-MEDiation Workshop for Turkish Stakeholders, 02/10/2023

4.1.1 Reflections on Turkish Workshop

The first stakeholder workshop of Turkish demo site was carried out **on October 2nd 2023** in TUBITAK Gebze Campus, Türkiye. ***75 participants*** attended from 35 different organizations being representatives of:

- Ministries,
- Local authorities,
- Municipalities,
- Water utilities, sewerage administrations,
- Wastewater treatment plant owners and operators,
- Universities,
- Research organizations,
- Ngo's,
- Unions,
- Industries,
- Private and public investors.

The workshop was run as two sections. In the morning section, the Project Coordinator (RINA-C) introduced brief project information followed by presentations about Greek, Italian and Turkish demo sites, aimed network strategy of project and Izmit Bay current situation. In the afternoon section, round table discussions were conducted with about 60 participants followed by wrap up the workshop with participants' feed backs.

In the questions and answer section before lunch, the participants raised some important questions as reported in the following;

- How the algae bioreactors will be operated?
- How it will be sustained that algae population will be dominant in the reactor since there will be challenges by considering their experience?
- How much area will be needed for the photo bioreactors and how it will be available in the existing wastewater treatment plants?
- The advantages and disadvantages of the technology should be compared with other technologies,

Main interests of stakeholders are on the operation and efficiency of algal bioreactors since having some limitations when it is compared the counterparts. The most challenging issues that were raised concerned area requirement and operational issues.

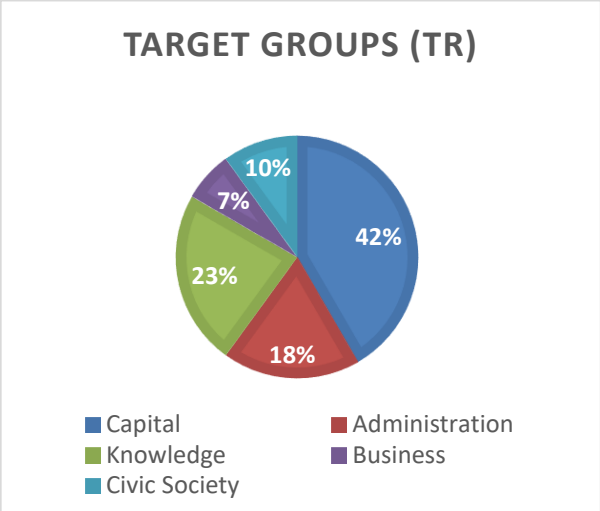
4.1.1.1 Round Tables (RT) results and discussion on Turkish Workshop

In the round table discussion, the participants were grouped in 6 tables in which all stakeholder groups had been presented. One representative of TUBITAK and YURT MUH project team were included in each table in order to moderate and ensure comprehensive participation and to facilitate insightful and fruitful discussions.

The table's constitution (*Table 3)* had been designed very carefully beforehand by the project team considering participants' profile in order to ensure each segment of the realization process express their perspective and to combine each aspect by integration of the whole frame. Discussions created a good vibe among participants and enabled each attendee to contribute actively and share their perspectives on the three thematic questions.

Table 3 :Table's constitution in Round Table discussion during the Turkish Workshop.

	TABLE-1	TABLE-2	TABLE-3	TABLE-4	TABLE-5	TABLE-6
1	Policy maker	Policy maker	Policy maker	Associations	Associations	Policy maker
2	Policy maker	Policy maker	Policy maker	Policy maker	Policy maker	Policy maker
3	Public Investor	WWTP utilities	Water utilities	University	Private Investor	WWTP utilities
4	Associations	Water utilities	WWTP utilities	Policy maker	Public Investor	Water Utility
5	University	Public Investor	Public Investor	Water utilities	Private Investor	Private Investor
6	University	University	University	Private Investor	WWTP utilities	NGO
7	Private Investor	Associations	Associations	University	WWTP utilities	WWTP utilities
8	Private Investor	Private Investor	Private Investor	R&D Centers	3rd party contractors	R&D Centers
9	3rd party contractors	3rd party	3rd party	Private Investor	R&D Centers	University
10	R&D Centers	Local Citizen	R&D Centers		University	
11	Private Investor	R&D Centers	Private Investor			



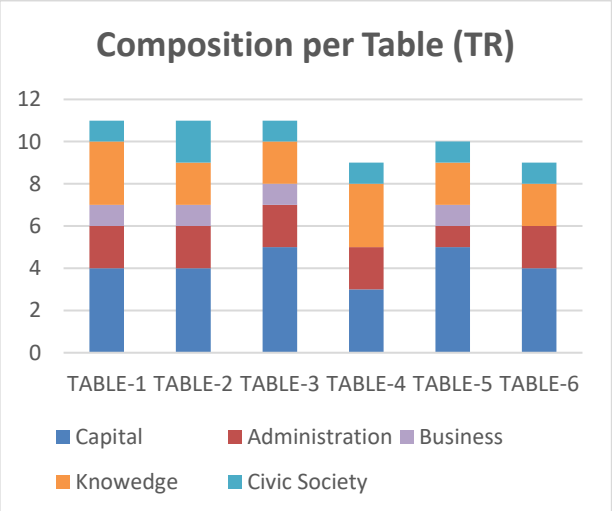


Figure 21 :Round Tables composition of Turkish Stakeholders, per target groups (left) and per table (right).

Round table participants were representatives of target groups that capital (42%), administration (18%), knowledge (23%), business (7%) and civic society (10%).

Each table filled one form of questionnaire presenting table's decision. Hard copies were collected for documentation and to analyse their input.

A: QUESTIONS ADDRESSING GENERAL UNDERSTANDING OF THE PROBLEM BY THE RESPONDER

A1: ***All the tables think*** that regarding the technical feasibility and associated costs of 50% pollutant removal from the sea by 2030, as recommended by the ***EU mission "restore our oceans and waters", are not realistic and they don't have faith***. They think that the cost would be very high, and the time would be not enough to fulfil the target.

Explanations of 'No faith' reasoning as provided by the stakeholders:

- Even EU forced, the 50% target is not realistic. Also, this target is not possible for Izmit Bay.
- Target year is so close. Cost of the investment should be considered.
- Because time is not enough and needed budget will be huge to reach the goal.
- Technically feasible but the cost would be high amount.
- Because of cost, lack of experienced technical personnel, not to be completed water quality monitoring in the basins.

A2: All the tables believe that the chemical pollution is an important problem in water. ***They mostly (5 out of 6 tables) think that this is a global (worldwide) problem***. Only one table (table 6th) believe that this is a local issue.

A3: All the tables have confidence in the ability of local authorities to take charge of chemical pollutants removal from water by improving the regulatory framework and adopt technology solutions (like the one proposed in the RHE-MEDiation project).

Sample of 'Confidence' reasoning a provided by the stakeholders:

- inter-institutional coordination and disseminating good practice examples through pilot projects.
- If there is an improvement in EU legislation this will be accommodated by Turkey.
- Only if the technical solutions economically and technically feasible.

A4: All the tables agreed on having full transparency about chemical pollution data measured in the water. They think that this knowledge gives people opportunity to remediate from polluted areas.

Explanations provided by the stakeholders:

- However, we need to promote the citizens.
- Increasing the level of social awareness will be effective.
- the education and awareness have to be started from young ages.

B: QUESTIONS ADDRESSING SPECIFIC UNDERSTANDING OF THE RHE-MEDIATION POTENTIAL IMPACT BY THE RESPONDER

B1: 4 out of 6 tables agreed that additional measures are needed as the RHE-MEDiation proposed technologies cannot alone mitigate the problem. 2 tables think that additional upstream measures need to be incorporated into the action.

Explanations of 'don't believe' reasoning as provided by the stakeholders:

- The technology would be more affective if it is applied to the industry, organized industrial areas.
- The results are not known yet, the lack of area in the existing plants.

B2: All tables stated that there are other viable solutions.

Some of their proposals were stated as:

- Membrane technologies, Ozone, Activated Carbon.
- Membrane, ozonation processes but each technology has its advantages and disadvantages.
- Chemical treatment methods.
- Generalize clean production technologies, pollution minimisation on the source.

B3: All the tables believe that ***the role of each stakeholder is very important*** for the project to succeed and have a lasting impact on the Mediterranean basin including and beyond the project completion period.

Explanations provided by the stakeholders:

- The role of stakeholders is important for the project to be permanent and widespread within the framework of common sense.
- Partnership structures and networking events lead to new project ideas and new investment areas.
- Each stakeholder should reflect its ideas in order to get success in the project.
- In order to improve success of the project public involvement and the improvement of legislation are very important.
- Since the applicators are the stakeholders, improve awareness, to have support.

B4: All the tables believe that ***the role of citizens is very important*** for the project to succeed and have a lasting impact on the Mediterranean basin including and beyond the project completion period.

Explanations provided by the stakeholders:

- If citizens demand, policy makers will pay more attention to the issue.
- But the citizens do not have impact.
- Citizens can be an element of pressure to expand the project implementation area.
- If the social awareness raise citizens will get their own precautions and will have impact on the success.
- Improvement of awareness.

C: QUESTIONS FOCUSING ON CAPTURING THE PERCEPTION OF THE LOCAL CONTENT AND POTENTIAL UPSCALE EFFECTS BY THE RESPONDER.

The answers given by the Turkish Stakeholders, can be grouped into five (5) categories:

1. **Environmental**
2. **Leisure & Recreation**
3. **Economic**
4. **Public Health**
5. **Other**

C1: The ***potential benefits at local level of any chemical pollutants cleaning action*** (like the one promised by RHE-MEDiation project) for the People and Organizations in the area around the Turkish demo-site are summarized in the *Table 4*.

Table 4:Turkish Stakeholders table statements on potential benefits at local level of any chemical pollutants cleaning action.

TURKISH STAKEHOLDERS	**TABLE-1**	**TABLE-2**	**TABLE-3**	**TABLE-4**	**TABLE-5**	**TABLE-6**
Environmental	Protection of ecosystem, Decreasing pollution	Biodiversity and aquaculture production would be increase	Water quality improved, Biodiversity increase	increase in biodiversity	protection and improvement of sea ecosystem	
Recreation/Leisure				increase in the tourism	improvement of tourism	benefit to tourism
Economic		Desalination cost would be decrease, Employment rate would be increase		economic benefits		economic benefits to public
Public Health	Public health		Public Health improved		improvement of public health	benefit to public health
Other						

The above analysis is presented foreach of the six different Tables and the answers of Turkish Stakeholders highlight the potential Environmental benefits for Izmit Bay through cleaning actions like the one of RHE-MEDiation. Recreation/Leisure, Economic and Public Health benefits are equally important.

C2: The perceived consequences in the long term if any action regarding the chemical pollutants in waters is not taken very soon in the area around the Turkish demo-site were summarized as follows:

Table 5 :Turkish Stakeholders Table statements on Long-term consequences of chemical pollutants in waters if there is no action.

TURKISH STAKEHOLDERS	**TABLE-1**	**TABLE-2**	**TABLE-3**	**TABLE-4**	**TABLE-5**	**TABLE-6**
Environmental	Ecosystem of Izmit Bay would be perished Spreading the pollution through other seas	Biodiversity would be decrease	Difficulties that will arise in the future due to the difficulty of the solution Ecosystem destruction	decrease in the biodiversity	resulting mucilage	negative impacts on ecosystem

TURKISH STAKEHOLDERS	TABLE-1	TABLE-2	TABLE-3	TABLE-4	TABLE-5	TABLE-6
Recreation/Leisure				polluted sea, decrease in tourism		increase on migration
Economic	Economic downturn on aquaculture production	Economic problems		economic difficulties		
Public Health		Public health would be perished	Diseases increased		negative impacts of public health	negative impacts on public health
Other						

Each tables emphasized long-term consequences on especially environmental, economic and public health. They will think that if there is no action on chemical pollution in waters this will cause decrease in biodiversity, economic problems by affecting mostly tourism sector and negative impact on public health.

C3: The potential challenges forecasting during scaling up of the RHE-MEDiation cleaning process to Turkey or other states in the Mediterranean basin were summarized in the Table.

Table 6: Turkish Stakeholders Table statements on Potential challenges.

TURKISH STAKEHOLDERS	TABLE-1	TABLE-2	TABLE-3	TABLE-4	TABLE-5	TABLE-6
Challenge-1	Insufficient current situation	Lack of authorized personnel	Legislation barriers	big areal requirements	big areal requirements	cost
Challenge-2	Lack of economical support	Lack of demanded area	Lack of finance	hard to operate	high cost	big areal requirements
Challenge-3	Area demand	Legislations	Lack of area	cost of investment	difficulties on effective usage of resulting algae biomass	lack of experienced personnel

In the table's discussions the potential challenges forecasted during scaling up of the RHE-MEDiation cleaning process are area demand, lack of experienced personnel, investment cost, lack of legislation and difficulties on effective usage of resulting algae biomass.

C4: The potential global benefits at Mediterranean level imagined by enabling capillary ***cleaning of all identifiable local HOT SPOTs*** through the technologies the RHE-MEDiation project were summarized in the *Table 7.*

Table 7 :Turkish Stakeholders Table statements on potential benefits for Mediterranean Sea through RHE-MEDiation.

	TABLE-1	TABLE-2	TABLE-3	TABLE-4	TABLE-5	TABLE-6
Environmental	Awareness	Clean seas, Nature Based Solutions would be expanded	Technology would be used for other sites, Environmental pollution would be decrease at global level	water quality improvement, increase in biodiversity		Becoming a leader in technology and becoming prestigious Contributing to the achievement of environmentally sustainable development goals
Recreation/ Leisure				tourism sector will be affected positively	improvement in tourism	
Economic			Strengthening global economic potential		improvement on fisheries	
Public Health	Global public health			Health sector will be affected positively		
Other	Making it compatible with international directives	Sustainability				Fulfilling responsibilities within the scope of international agreements

In the stakeholders tables the potential benefits on environmental, economic and public health were discussed and agreed on that environmental pollution would be decrease at global level, that will cause increase in biodiversity and improvement of public health. Tourism sector will be affected in a positive way and there will be an increase in employment rate. All these improvements will cause economic developments and economic benefits in overall. Stakeholders also agreed on benefits for fulfilling responsibilities within the scope of international agreements.

4.1.1.2 2nd Survey for Turkish Stakeholders

The second survey prepared on Microsoft Forms in Turkish language and took place in real-time at the last session of the workshop just after the round table discussion. The day after the workshop, all participants were contacted, and a reminder was sent for the 2nd survey participation until 23rd October.

2nd Survey was answered by 45 participants among the workshop attendees.

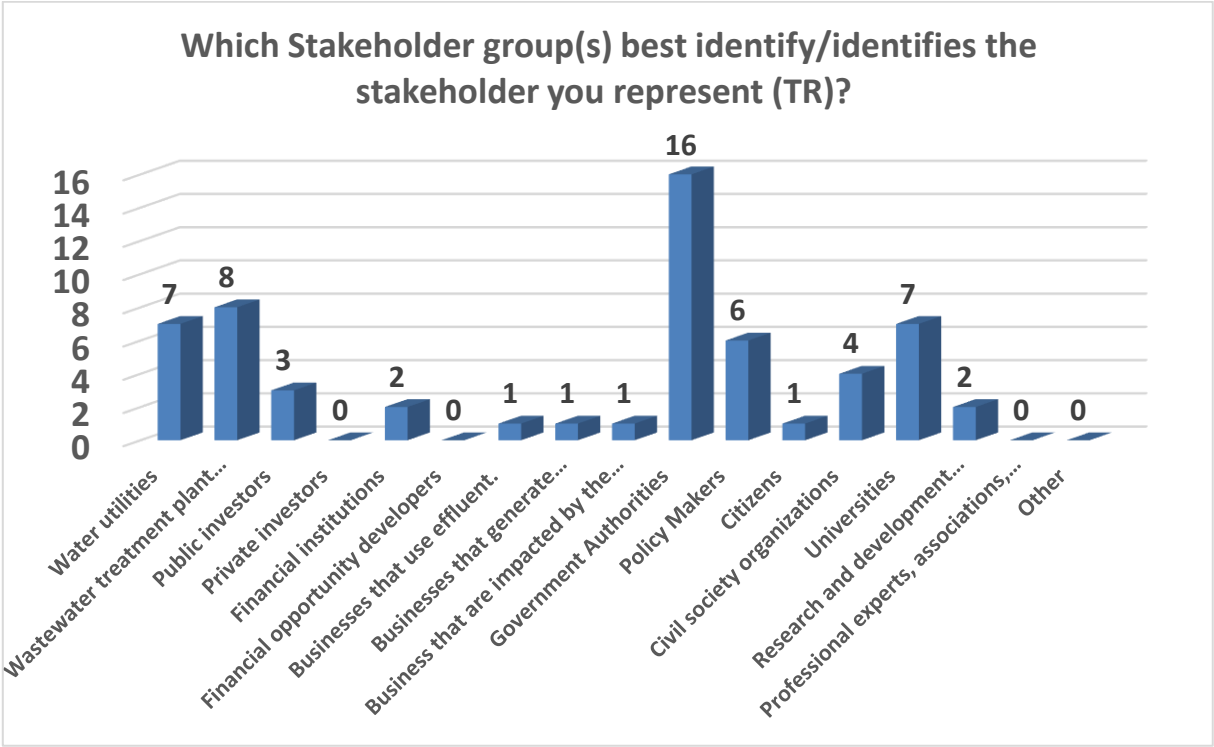


Figure 22 : High-level stakeholders groups during the Turkish Workshop.

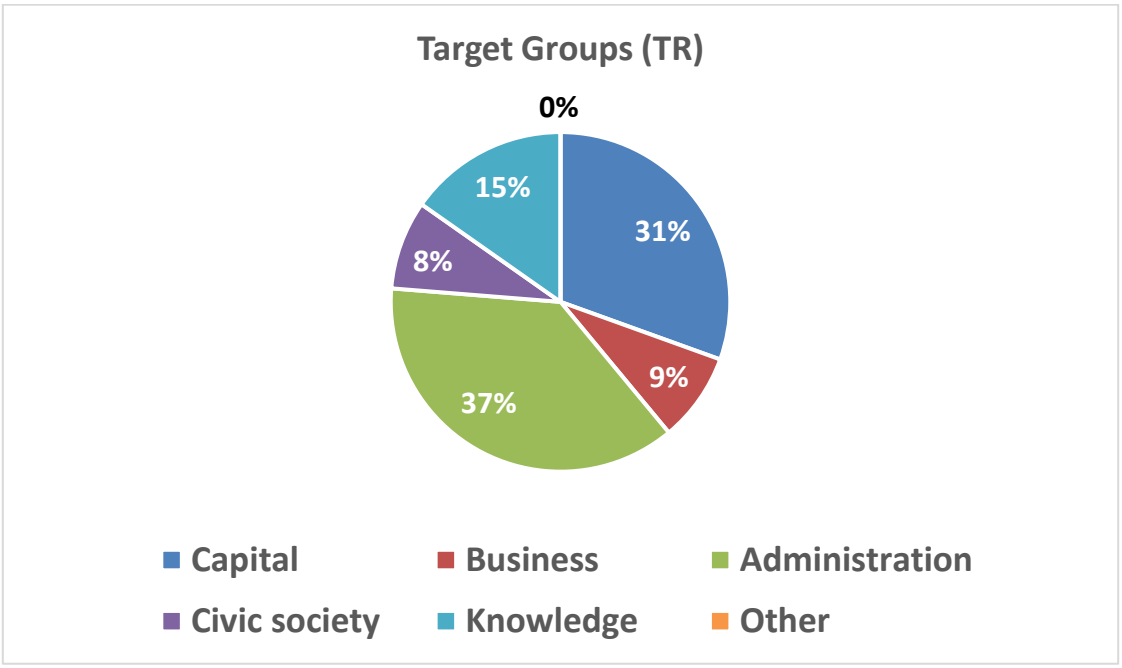


Figure 23: Target Groups of Turkish Stakeholders during the Turkish Workshop.

When results were grouped, 2nd survey participants were found to be representatives of target groups that capital (31%), administration (37%), knowledge (15%), business (9%) and civic society (8%). It is concluded that civic society participation is higher than the first survey.

The answer to the question presented very interesting findings.

Q3: 56% of the participants trust the accuracy of the EU mission while 40% of them do not trust. 4 % didn't know.

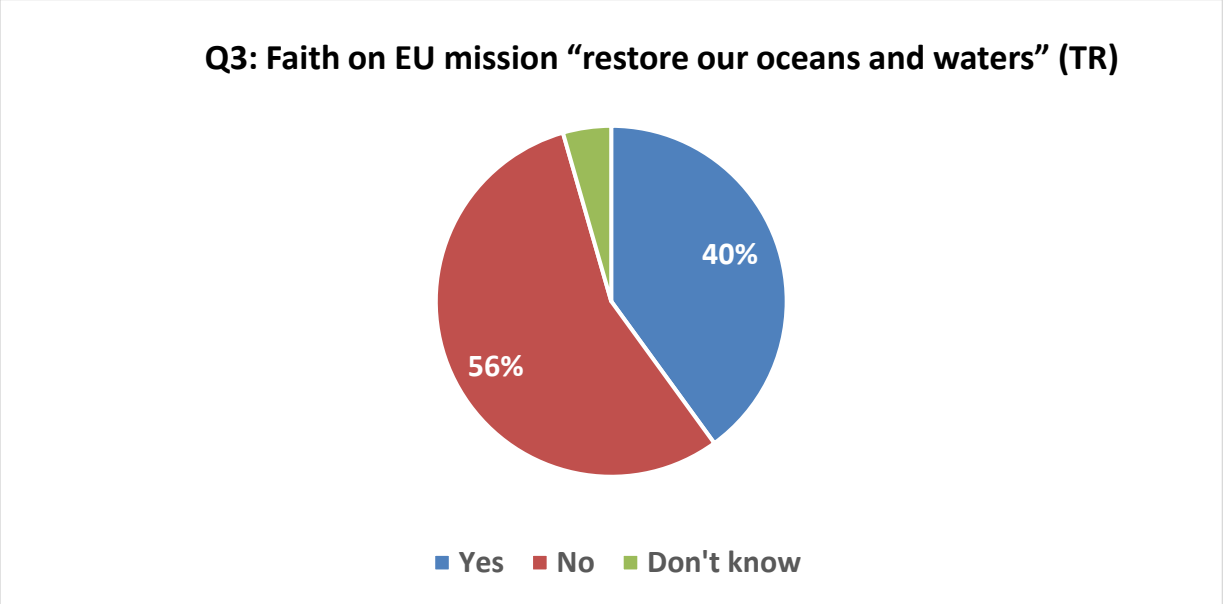


Figure 24 :Faith on EU mission "restore our oceans and waters" during the Turkish Workshop.

Q4: Most of the participants (89%) think that chemical pollution in water is a global issue. Only 7% think of that as national problem and 4% of them as local concern.

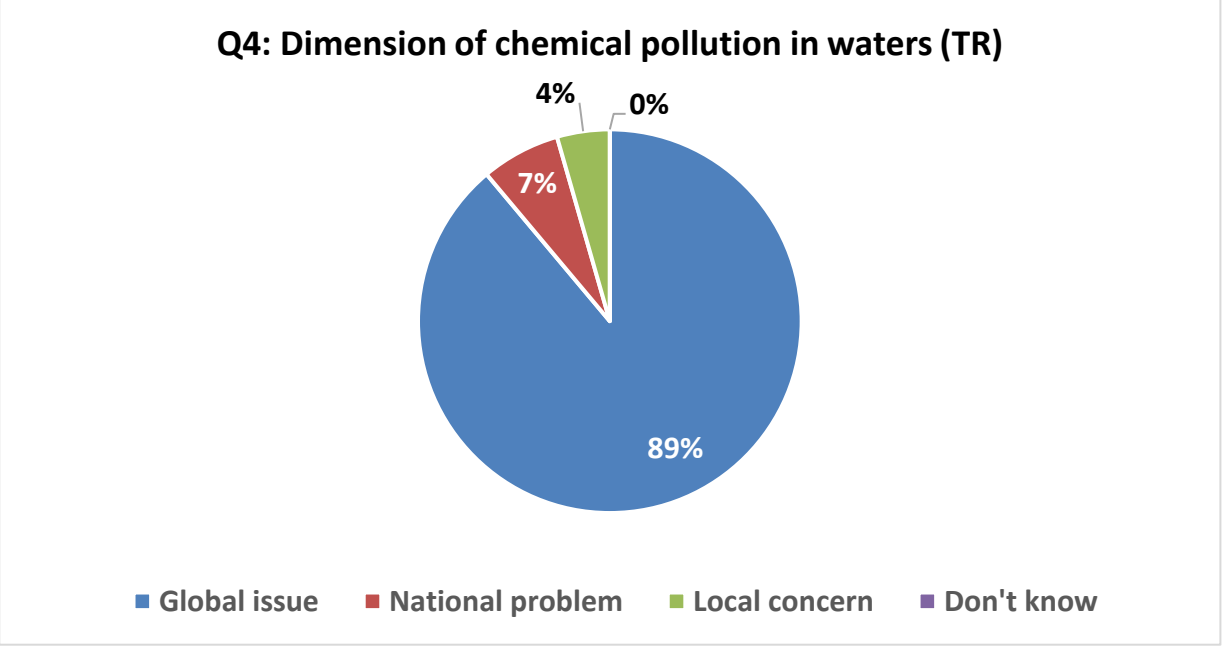


Figure 25 : Turkish Stakeholders about dimension of the chemical pollution in waters during the Workshop.

Q5: 91% of the participants believe that local authorities can effectively manage chemical pollutant removal from water through regulatory improvements and technology solutions like RHE-MEDiation proposes. 5% do not believe, 4% have no idea on the issue.

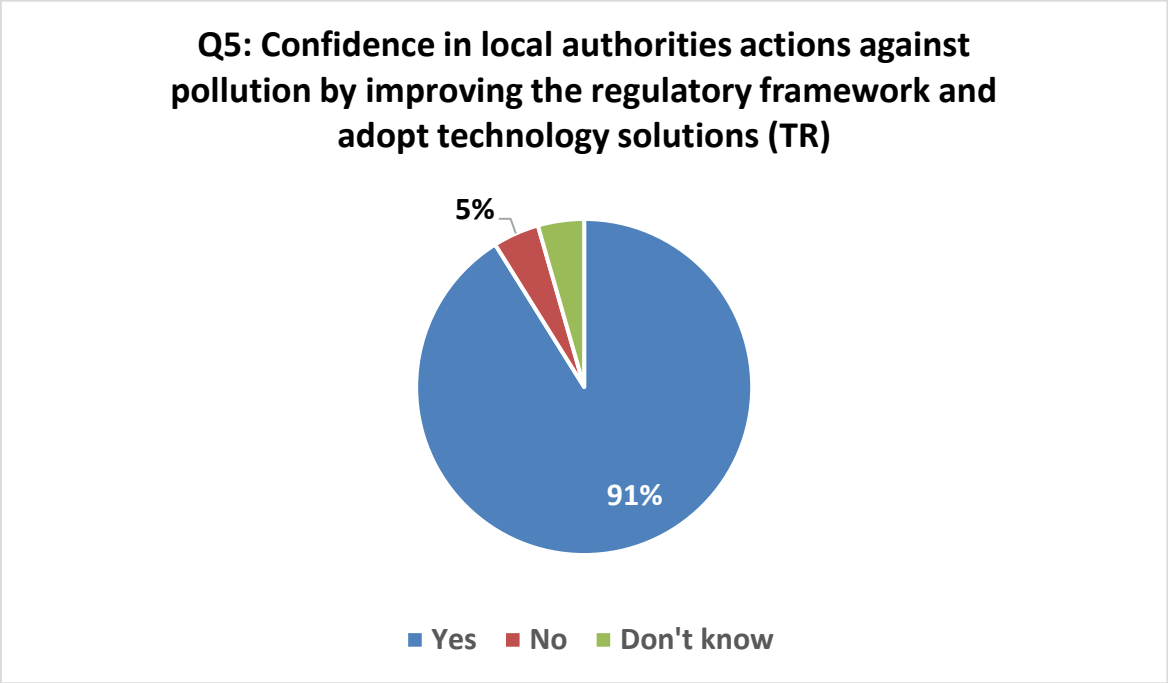


Figure 26 : Confidence in local authorities of Turkish Stakeholders during the Workshop.

Q6: 96% of the participants agree with the idea that transparency in chemical pollution data make people more confident in the remediation of polluted areas.

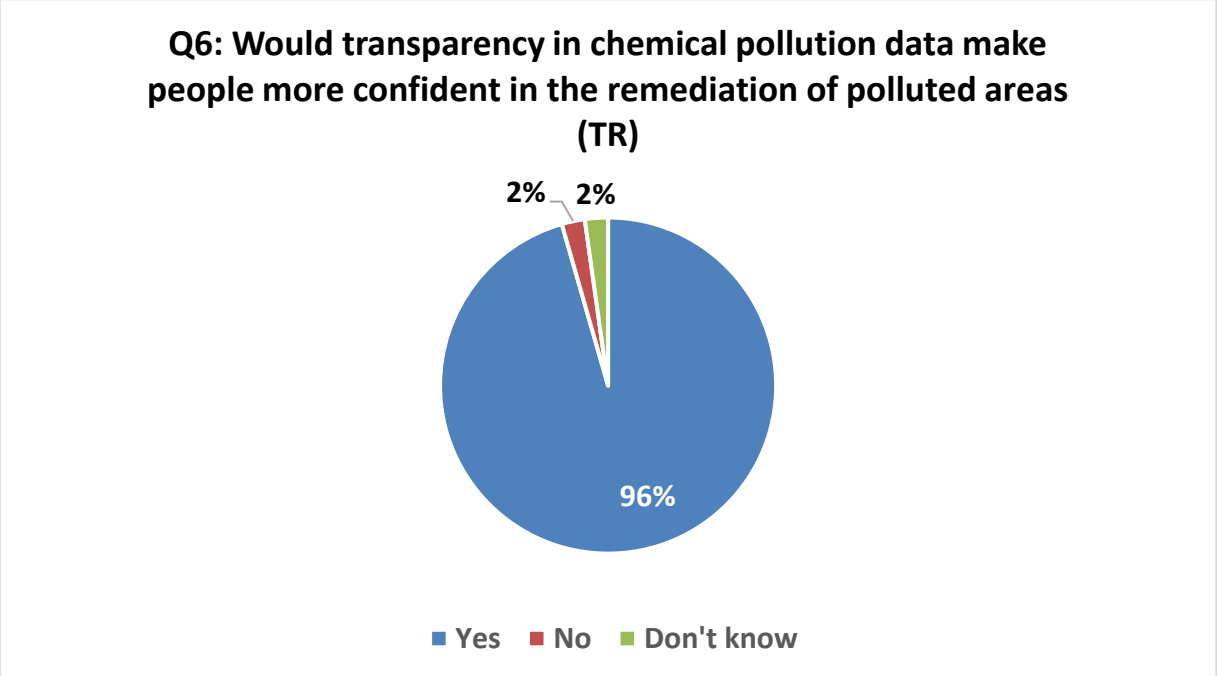


Figure 27 : Turkish Stakeholders thoughts about data transparency during the Workshop.

Q7: 80% of the participants believe that RHE-MEDiation's remediation technology can contribute to pollution-free HOTSPOTs. 16 % of the participants do not know about the issue and only 4% of them think that the technology cannot contribute.

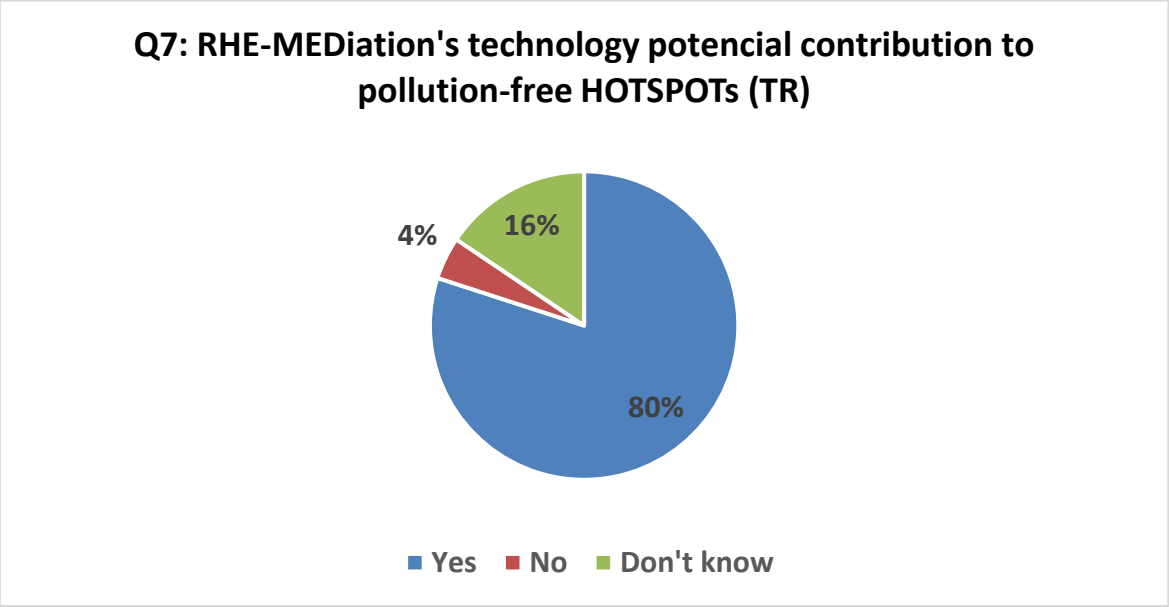


Figure 28 : Turkish Stakeholders thoughts about RHE-MEDiation technology during the Workshop.

Q8: 96 % of the participants agree that additional upstream measures (e.g., replace with less pollutants solution) are needed alongside RHE-MEDiation's technology to address HOTSPOT issues.

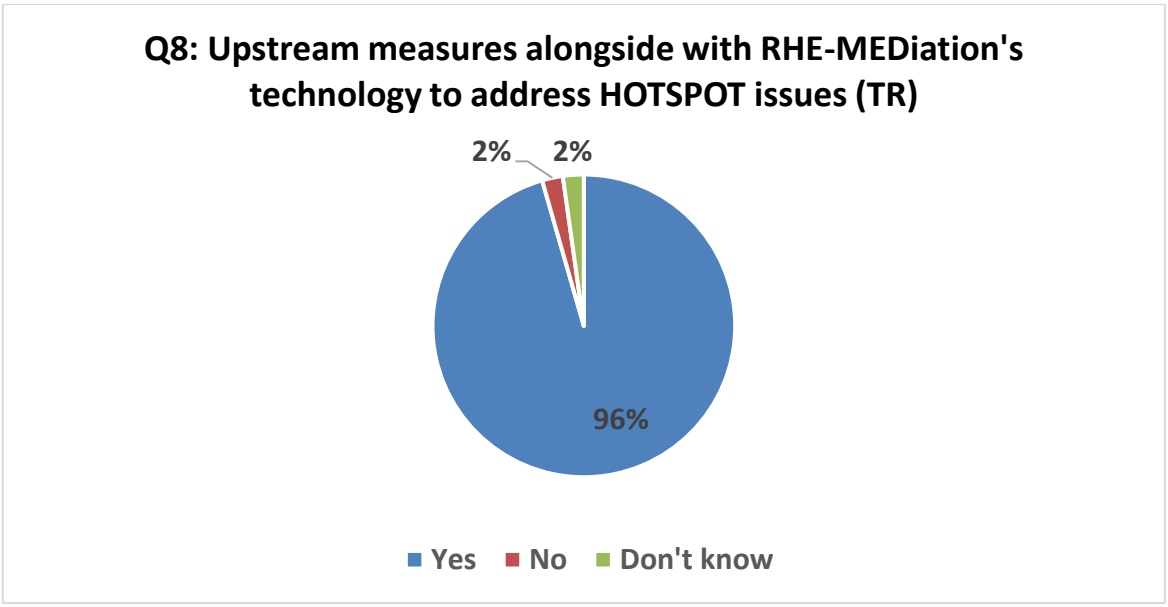


Figure 29 : Turkish Stakeholders thoughts about RHE-MEDiation technology along with upstream measures during the Workshop.

Q9: ***Can you suggest alternative solutions for addressing water quality pollution in HOTSPOTs aside from what RHE-MEDiation proposes?***

Implementing preventive solutions by reducing pollution on-site Turkish Stakeholders suggest:

- Membrane technologies;
- Ozone;
- Methods or installing photobioreactors in Organized Industrial Zones;
- Constructed Wetlands;
- Buffer zone applications;
- Best Available Techniques for cleaner production;
- Chemical wastewater treatment methods;
- Reverse Osmosis;
- Activated carbon;
- Macroalgae cultivation;
- Hydrogels.

Q10: 87% of the participants were satisfied with the information given in the workshop. 4 % is not satisfied and 9% is no idea.

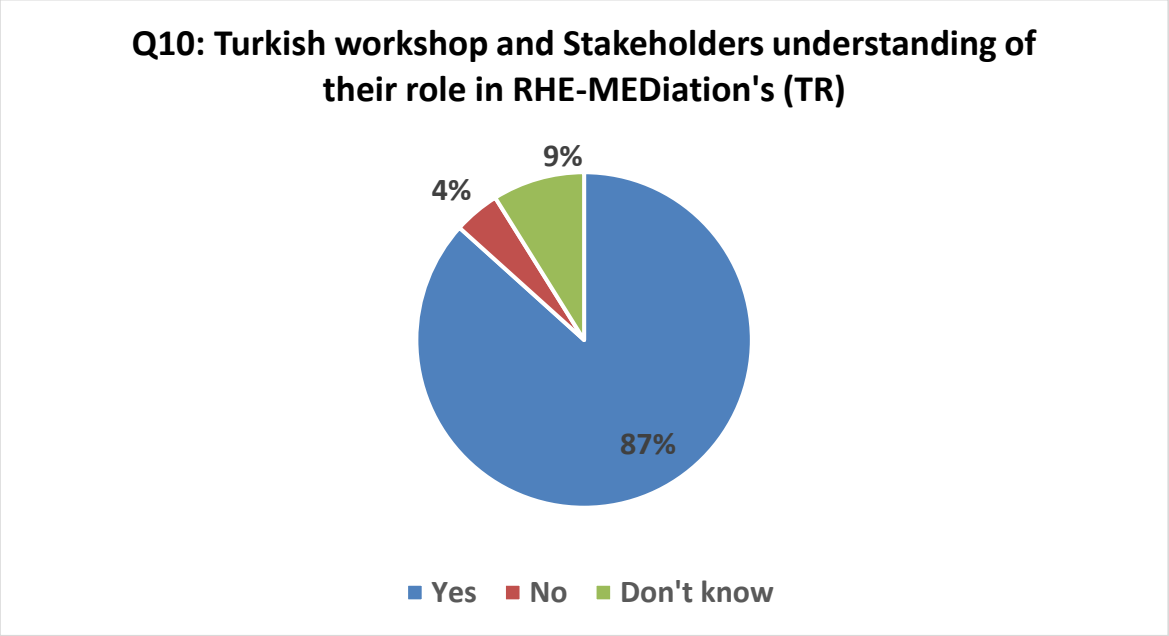


Figure 30 : Turkish Stakeholders thoughts on workshop target during the Workshop.

Q11: The view on RHE-MEDiation's networking strategy is largely positive, aligning with the opinions of 93% of the respondents. None of the answers were negative (the other responses were 'don't know' or 'no opinion').

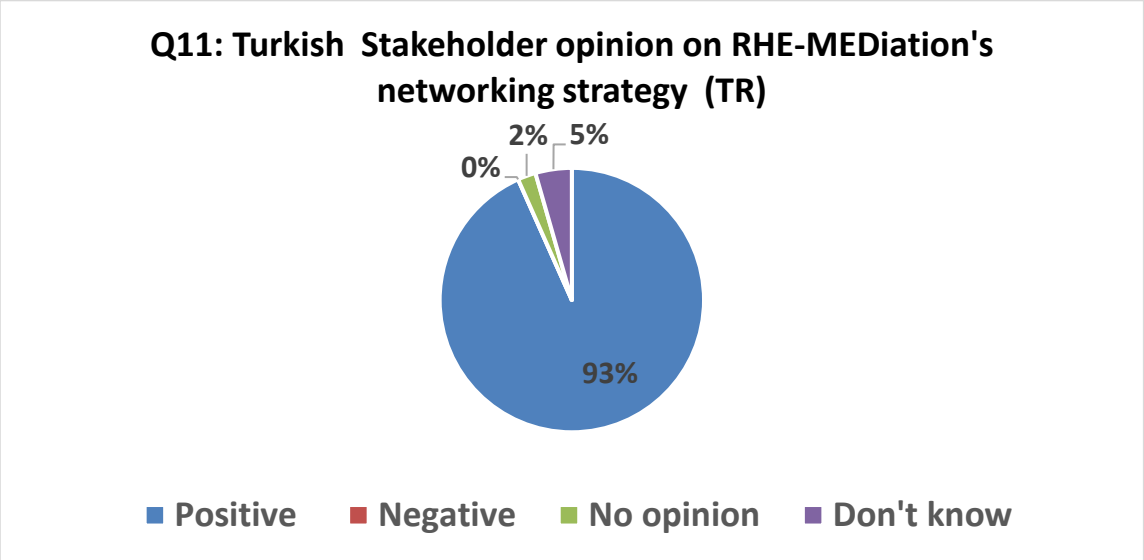


Figure 31 : Turkish Stakeholders thoughts on network strategy during the Workshop.

4.2 Greek Workshop on 4th of October 2023

Invitation of stakeholders

In order to achieve RHE-MEDiation hub goals an official invitation was sent by email to more than 100 different stakeholder organizations representing 5 the main target groups. More than 30 organizations accepted our invitation by e-mail and provided assigned representatives (names and contact information) for future communications. During the project period, it is aimed to ensure the cooperation between the project team and stakeholder institutions, channel the information transfer, evoke consultation, promote the involvement of stakeholder institutions in the project and ultimately the formation of specialized groups to assist RHE MEDiation in its goals.

Figure 32 : RHE-MEDiation Workshop for Greek Stakeholders, 04/10/2023.

4.2.1 Reflection on Greek Workshop

A central focus of the project involves establishing a community of stakeholders from diverse backgrounds. This effort begins with the participants of the 1st workshop, who have committed to remain actively engaged with the project. They will contribute through various means, including disseminating information, taking localized actions in Elefsis, and exerting pressure on decision-makers, all with the goal of supporting the project's objectives.

EYDAP (and HCMR?) organized on 4 October the First RHE-MEDiation Workshop in order to communicate and disseminate ***RHE-MEDiation innovative technologies and services*** to the ***Greek Stakeholder Network***. More than ***40 stakeholders*** participated, representatives from Water and Wastewater Utilities, Governmental Authorities*, impacted Business*, Academic Community, Research Centers, private sector and citizens.

The workshop was conducted in two sections in the first section In the introductory part the participants were informed about all the research activities of RHE-MEDiation project from EYDAP and HCMR researchers. The discussion also touched upon the new regulatory framework established by the New European Water Reuse Directive. Through live connections with Italy and Turkey, the participants received information regarding the project that will be developed in the Mediterranean region. Next, they delved into the specific case of the Gulf of Elefsis in Greece, where the innovative technology of the project will be piloted. Both EYDAP and HCMR provided insights into the monitoring of chemical pollutants in Elefsis. They presented the project's objectives aimed at reducing of chemical pollution in the Mediterranean Sea and emphasized the potential dangers posed by certain substances that threaten the marine environment, including heavy metals, pesticides, P.F.A.S., and "forever chemicals".

During the second session of the workshop, the guests were divided into three smaller working groups (Round Tables), where they discussed more details about the project and provided a feed back to the project team. Certificates of participation were offered by name to each guest.

After the Round Tables, a real-time 2nd survey took place, in order to evaluate the success of the Workshop.

The discussion among the Stakeholders triggered some important points in terms of exploitation and the RHE-MEDiation services that where are most suitable for application in Greece.

4.2.1.1 Round Tables (RT) results and discussion on Greek Workshop

The approach taken during the Greek Workshop, utilizing roundtable discussions and targeted questionnaires, is an effective method for engaging stakeholders and assessing their perspectives on the RHE-MEDiation project. The inclusion of representatives from all relevant target groups and the use of moderators from EYDAP and HCMR facilitated the comprehensive participation and insightful discussions.

The division of participants into smaller groups allowed for more focused and in-depth conversations, enabling each attendee to contribute actively and share their perspectives on the three thematic questions (A, B, C). Collecting hard copies of the participants' responses for Deliverable 1.2 not only ensures the documentation of stakeholders' views but also facilitates the analysis of their input to gauge the project's current standing and feasibility.

The differentiation of stakeholder groups and high-level stakeholders in the table is a crucial step towards understanding the diverse perspectives and priorities of each group. This approach provides valuable insights into the varying interests and concerns that different stakeholders might have regarding the project, enabling the project team to tailor their strategies accordingly. The comprehensive engagement of ***25 stakeholders***

across the three Round Tables, along with the assistance of six representatives from EYDAP and HCMR, highlights the concerted effort to involve key actors in the discussion and decision-making process.

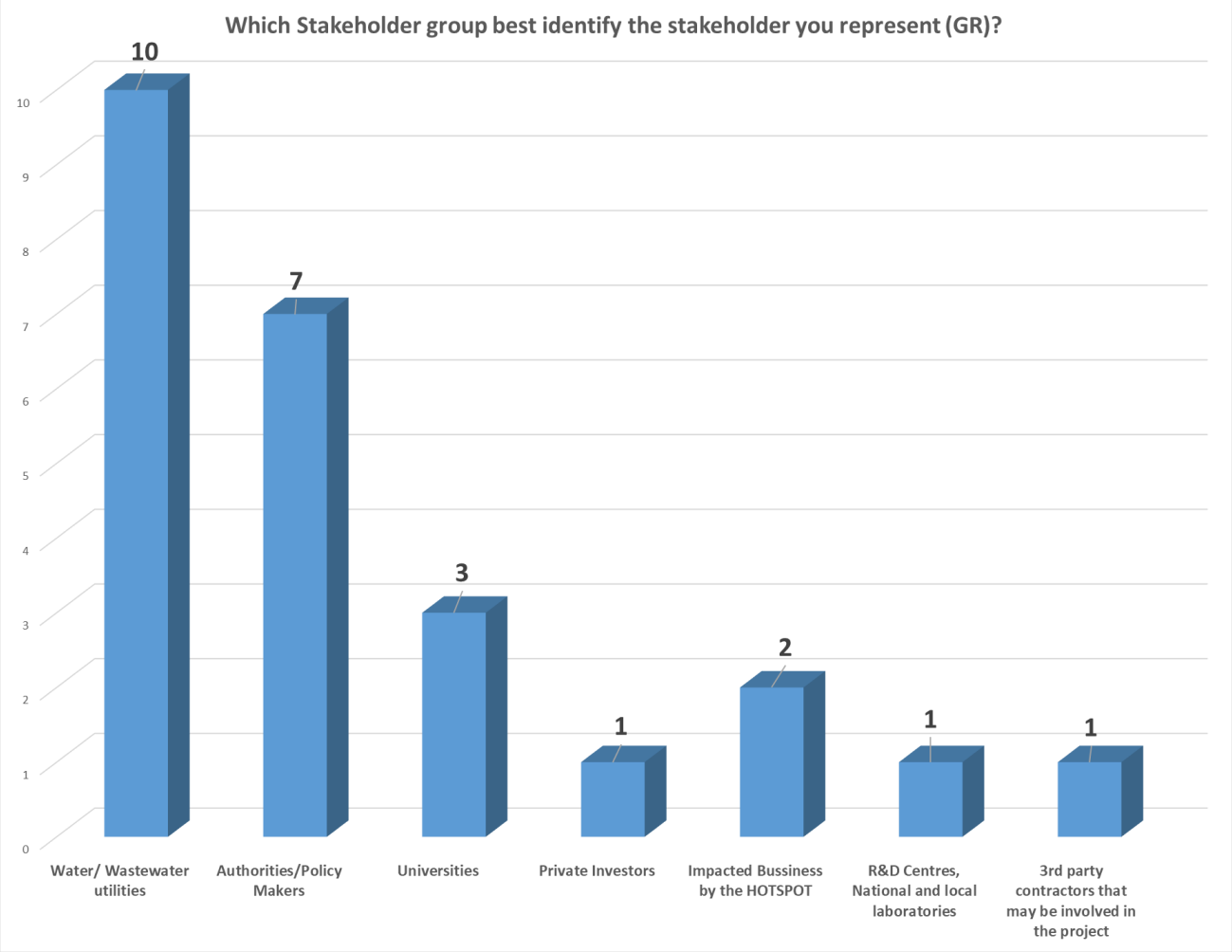


Figure 33 : High-level Greek stakeholders' groups that participated in Round Tables.

Figure 33, displaying the distribution of the stakeholders, provides a visual representation of the diverse array of stakeholders involved in the project.

As shown in *Figure 34*, Stakeholder present were representatives were from all five target groups

1) Businesses

2) Administration

3) Civic Society: Citizens (Elefsis city and surroundings)

4) Knowledge: Universities, Research and development centers.

5) Capital: Water and Wastewater Utilities

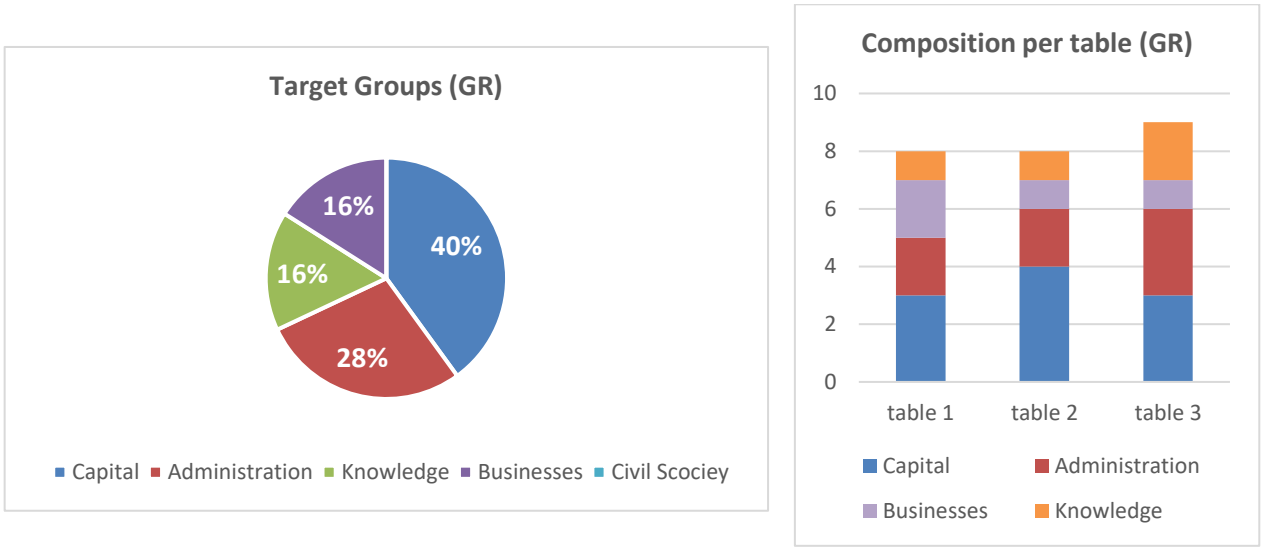


Figure 34 : Round Tables composition of Greek Stakeholders, per target groups (left) and per table (right).

The active participation of stakeholders from all five target groups, demonstrates the diverse and inclusive nature of the stakeholder engagement strategy within the RHE-MEDiation project. By engaging representatives from these varied sectors, the project can benefit from a comprehensive range of perspectives, expertise, and resources, fostering a collaborative and well-rounded approach to addressing water pollution in the Mediterranean Sea.

The involvement of businesses, such as Helleniq energy, Chemitec, Metrolab, Aerata Solution, and Tree Company CO, highlights the project's commitment to engaging with industry leaders and private sector entities. By collaborating with these businesses, the project can leverage their expertise, resources, and innovative capacity to develop and implement effective pollution control measures, fostering a culture of corporate responsibility and environmental stewardship within the business community.

The participation of the 'Special Secretariat for Water' under the Ministry of Environment and Energy reflects the project's engagement with governmental bodies and regulatory authorities. By collaborating with these administrative entities, the project can ensure alignment with regulatory standards and policies, fostering a supportive regulatory environment that facilitates the successful implementation of pollution control initiatives and the adoption of innovative technologies.

The involvement of citizens, represented by the civil society, underscores the project's commitment to engaging with the broader community and fostering public awareness and participation in pollution control efforts. By soliciting input and feedback from citizens, the project can ensure that the perspectives and concerns of local communities are incorporated into the decision-making process, fostering a sense of collective responsibility and ownership toward environmental preservation.

The participation of universities, including NKUA and NTUA, and R&D Centers, such as NCSR Demokritos, highlights the project's collaboration with academic and research institutions. By leveraging their knowledge, research, and technological capabilities, the project can access cutting-edge expertise and foster a culture of innovation and knowledge exchange, contributing to the development and implementation of advanced pollution control technologies and methodologies.

The involvement of water and wastewater utilities, (including DEYA's of Nafplio, Loutraki, and Alexandroupoli, emphasizes the project's engagement with key stakeholders in the water management sector. By collaborating with utilities, the project can leverage their operational insights, infrastructure, and industry expertise, fostering a practical and solution-oriented approach to pollution control and water quality management.

Overall, the active engagement of stakeholders from diverse sectors within the RHE-MEDiation project highlights the project's commitment for a collaborative, multidisciplinary approach to addressing water pollution in the Mediterranean Sea. By leveraging the collective expertise, resources, and perspectives of these stakeholders, the project can effectively develop and implement sustainable pollution control measures that align with the needs and priorities of various stakeholders, ultimately contributing to the long-term preservation and ecological health of the Mediterranean Sea.

A: QUESTIONS ADDRESSING GENERAL UNDERSTANDING OF THE PROBLEM BY THE RESPONDER

A1: The majority of the participants (65%) stated that the do NOT believe that the aim of the EU Mission "restore our oceans and waters" on pollution is feasible. Interestingly looking into the answers of the different stakeholder Target Groups the 'Business' representatives have a different opinion as 75% believed that the aim is feasible. On the other hand, all 'Knowledge' declared their pessimism on the achievement of the Mission goal, same as the 'Administration' group.

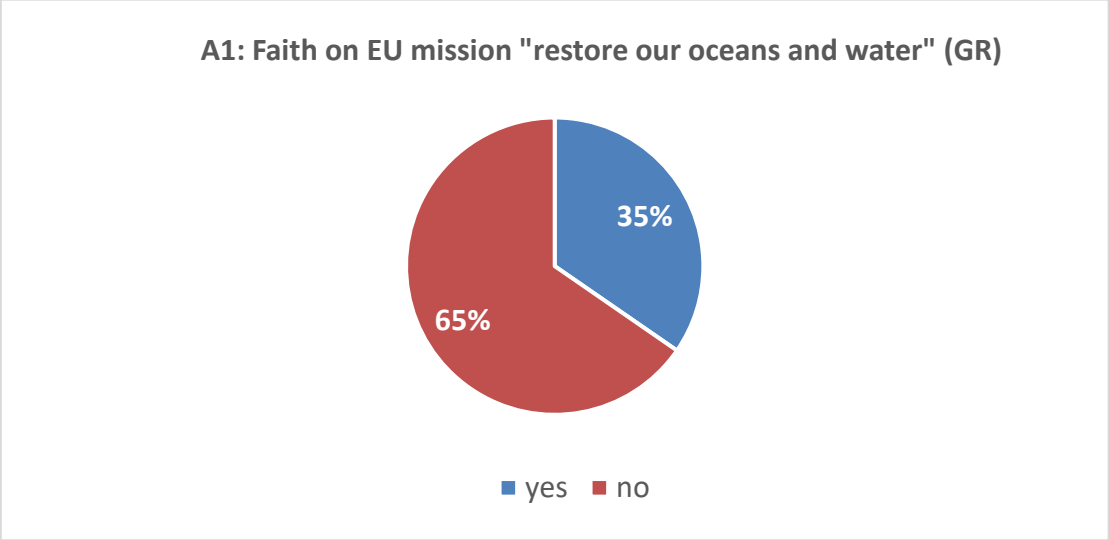


Figure 35 : Faith of Greek Stakeholders on EU mission "restore our oceans and waters".

Explanations of '<u>No faith</u>' reasoning as provided by the stakeholders:

- requirement of large Investments and mobilization of Water Bodies and other involved parties (contractors and consultants) for the upgrading of existing WWTP or the construction of new ones;
- there must be harmonization and implementation of the directive at the National level;
- high cost technology/ is it economical or efficient? short time until 2030;
- high pollution load and in depth;
- There are pollutants that I have faith (e.g. marine litter) and other no (metals).

Explanations of 'faith' reasoning as provided by the stakeholders:

- if the corresponding instructions are followed and there is a control, perhaps it will succeed in its mission;
- use of algae;
- a lot of responsible Authorities and the majority of citizens need to be informed.

A2: All the participants unanimously agreed that chemical pollution is a major problem in waters. However, there was a differentiation on the geographical scope of the problem. ***Almost 80% assigned it as a worldwide problem*** and only 7% believed it is of local importance. This differentiation is attributed mainly to the responses of the 'Authorities' group which understandably perceive the issue equally as a national issue too.

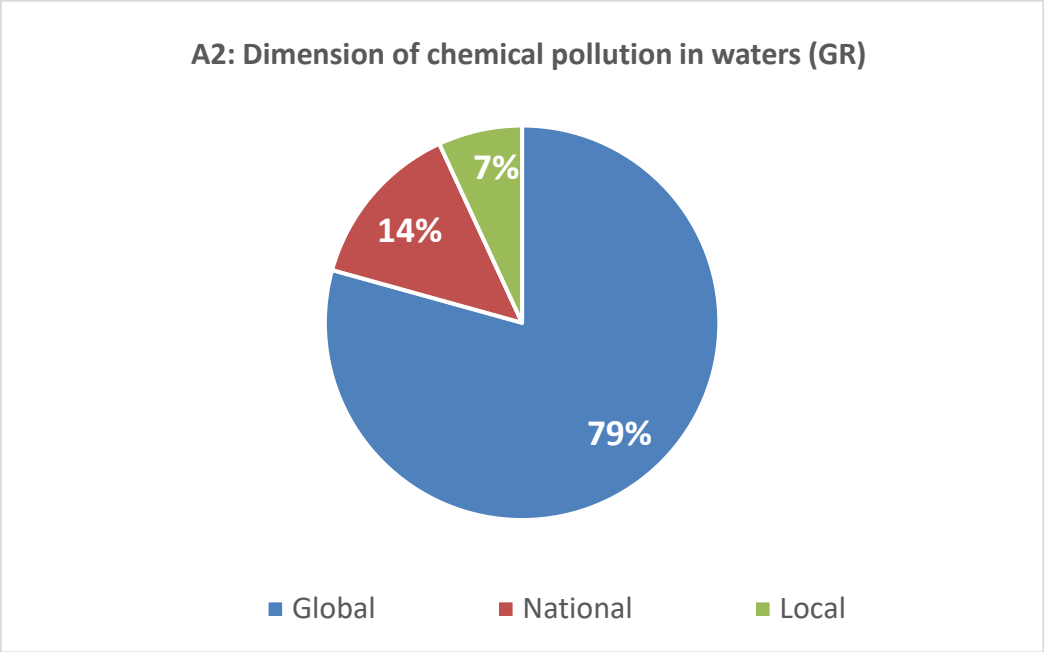


Figure 36 : Greek Stakeholders about dimension of the chemical pollution in waters.

A3: The majority of the stakeholders (68%) have confidence on the ability of the local authorities to mediate the issue taking advantage of the policy regulation and technological / scientific solutions available. 'Capital' and 'Business' gave a mixed signal as they provided equally divergent answers but as 'Administration' and 'Knowledge overwhelmingly provided a positive answer (not surprisingly), results need to be further investigated.

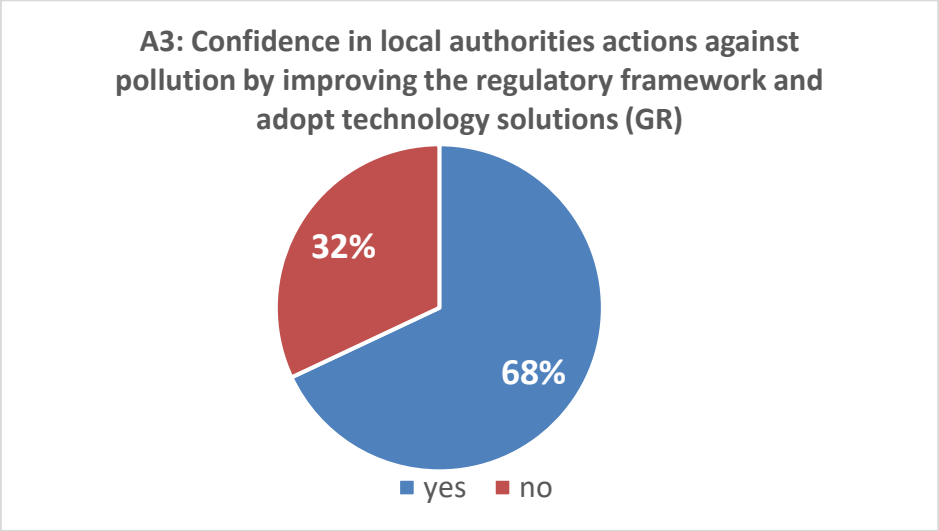


Figure 37 :Confidence in local authorities of Greek Stakeholders.

Explanations of 'Confidence' reasoning a provided by the stakeholders:

- forced to comply with new directives
- implementation of directive 91/271 has been done by water utilities at a satisfactory level
- they can as long as they are willing to work very hard to achieve it

Explanations of 'No confidence' reasoning as provided by the stakeholders:

- they can but they need resources and support from the European Union
- experience shows that at the local level of governance, decisions are taken late and implemented selectively or after pressure from higher bodies or agencies
- insufficient staffing and financial resources
- local authorities applying European laws
- If it does not become attractive in the market it will be difficult to be adopted by stakeholders

A4: Almost all participants (96%) agreed on the importance of having full transparency on the collected data.

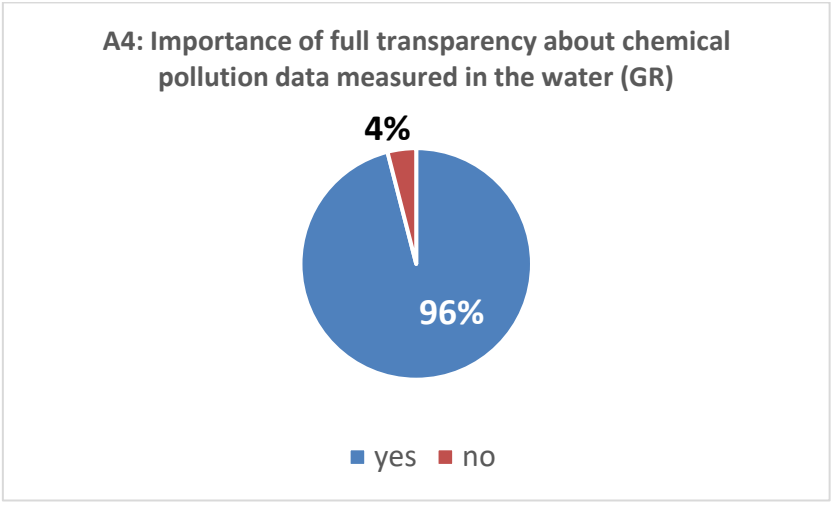


Figure 38 : Greek Stakeholders about transparency on pollution data.

Explanations provided by the stakeholders:

- workshops with environmental organizations, information campaigns with TV spot, schools citizen science, schools
- Awareness of citizen science, schools, fishermen, sea industry, chemical and pharmaceutical industries etc.
- Active Citizens will lead the agencies to vigilance and mobility
- ignorance of citizens
- Awareness of citizen /legislation

B: QUESTIONS ADDRESSING SPECIFIC UNDERSTANDING OF THE RHE-MEDIATION POTENTIAL IMPACT BY THE RESPONDER

B1: 96% of the stakeholders agreed that additional measures are needed as the RHE-MEDiation proposed technologies cannot alone mitigate the problem.

Explanations provided by the stakeholders:

- I have the impression that it is difficult to transport technologies work more effectively when combined as with bioremediation & physical Chemical processes;
- all stakeholders must participate, but also citizens;
- coordinated effort of actions of institutions and individuals;
- beyond knowledge and data universal application of results is required;
- control of pollution at source.

B2: All participants stated that there are other viable solutions.

Some of their proposals were stated as:

- selection of Eco-Friendly products;
- removal of pollutants before WWTP. The industries install modern biological treatments and control of possible illegal disposal;
- removal of pollutants before WWTP;
- new technologies will bring new solutions;
- prohibition, restriction of the use of chemical substances that cause pollution, cosmetics, microplastics;
- NBS solutions;
- use of algae for medicines and green chemistry.

B3: The role of the stakeholders is important for the project as agreed by all participants.

Explanations provided by the stakeholders:

- application of good practices that are forced by European legislation guidelines in the design of new projects or the upgrading of existing ones;
- taking actions from stakeholders;
- continuous update and control;
- communication of the goal in other areas as well;
- a comprehensive and multifaceted view of all stakeholders is necessary;
- participation in the design of technologies and pilot programs.

B4: Similarly, the ***role of citizens is very important as 92%*** of the participants replied.

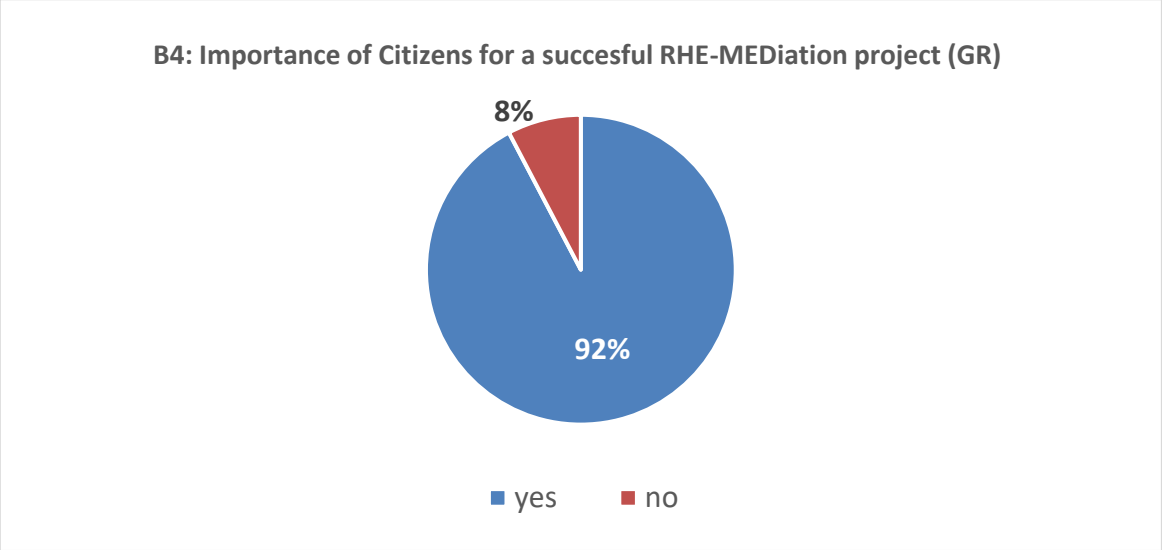


Figure 39 : Greek Stakeholders about importance of Citizens in RHE-MEDiation project.

Explanations provided by the stakeholders:

- dissemination of information;
- reduction of consumption and use of polluting products;
- Awareness;
- training, free access to the results;
- not necessary, there must be information and knowledge;
- Citizen science;
- informing other citizens & recording incidents of pollution or other differences;
- it depends of the political will and awareness of the society.

C: QUESTIONS FOCUSING ON CAPTURING THE PERCEPTION OF THE LOCAL CONTENT AND POTENTIAL UPSCALE EFFECTS BY THE RESPONDER

The answers given by the Greek Stakeholders, can be grouped into five (5) categories :

1. **Environmental**
2. **Leisure & Recreation**
3. **Economic**
4. **Public Health**
5. **Other**

C1: The analysis *Table 8* is divided on the different Target Groups and their answers on the potential benefits at local level of any chemical pollutants cleaning action (like the one promised by RHE-MEDiation project). The answers of ***all Greek Stakeholders highlight the potential Environmental, Recreation/Leisure and Economic benefits for Elefsis Bay*** through cleaning actions like the one of RHE-MEDiation. Public Health benefits are of secondary importance.

Table 8 : Greek Stakeholders TG statements on potential benefits at local level of any chemical pollutants cleaning action.

GREEK STAKEHOLDERS	Water Utilities	Business	Authorities	Academia/Research
Environmental	Improvement of: marine environment, water quality, biodiversity	Improvement of: environment, water quality, biodiversity	Improvement of: environment, water quality, biodiversity, ecosystem	Improvement of: environment, water quality, biodiversity, ecosystem, conservation
Recreation/Leisure	Improve and promote swimming (water quality), quality of life	Improve and promote swimming (water quality), quality of life	Improve and promote swimming (water quality), quality of life, human health, access to clean sea, Increase site visitations	greener areas, parks, more activities
Economic	fisheries, catering, tousism, sustainable development	fisheries, development of industrial areas, jobs, reused water quality	development opportunities of coastal and marine productive activities, development of industrial areas, investment opportunities, creation of jobs, reused water quality.	energy utilization of resulting biomass in industry, area development
Public Health			Human health	
Other				

C2: If action is not promptly taken regarding the chemical pollutants in the waters around the Greece demo-site, the long-term consequences could be severe, leading to a range of detrimental impacts such as environmental degradation, an increase in pollution levels, irreversible effects on the ecosystem, economic decline, jeopardized fisheries, and a compromised marine ecosystem *Table 9*. This could result in further detrimental effects including the extinction of species, a heightened risk to public health, restrictions on human activities like fishing and tourism, as well as potential non-compliance with future directives, ultimately necessitating extreme measures such as the evacuation and relocation of residents. Moreover, the pollution may further spread beyond the immediate area, exacerbating the degradation of both the local environment and the wider ecosystem.

Table 9: Greek Stakeholders TG statements on Long-term consequences of chemical pollutants in waters if there is no action.

GREEK STAKEHOLDERS	Water Utilities	Business	Authorities	Academia/Research
Environmental	environmental degradation (water quality), pollution, unhealthy fish, species extinction,	environmental and ecosystem degradation (water quality), pollution, impact on marine and terrestrial life, effluent water	pollution, extinction of species, ecosystem health degradation, irreversible desertification, current situation will not change	pollution, ecosystem health degradation, effects on biological level
Recreation/Leisure	negative (no swimming, degradation of human activities)		negative (bathing waters degradation)	
Economic	Economic degradation of human activities such as fishing and tourism, fisheries, evacuation and relocation of residents		Degradation of fisheries society and economy, unutilised natural resources	Degradation of fisheries society and economy, unutilised natural resources
Public Health		metals bioaccumulation through fish, other, food chain)	bioaccumulation through fish, citizen health)	health risk
Other	incompliance with future directives			

C3: The potential challenges during the scaling up of the RHE-MEDiation cleaning process to Greece or other states in the Mediterranean basin can be summarized as follows, taking into account the perspectives of different target groups:

Water Utilities

- Availability of surface waters.
- Space requirements for setting up the necessary infrastructure.
- Integration of the process into European and national regulatory frameworks.
- Ensuring economic feasibility and sustainable funding.
- Dealing with different wastewater treatment scenarios and conditions.
- Managing the acceptance of the implemented technologies by the polluters.
- Contingency plans for potential failures and disposal of by-products.

- Facilitating technology development by supplier companies.
- Addressing community pressure regarding the use of the technology and considering alternative approaches.

Business

- Ensuring the continuous operation and optimization of the implemented system.
- Identification and management of all by-product pollutants.
- Understanding the specific characteristics of each demo case for effective implementation.
- Developing new cleaning methods to improve efficiency.
- Conducting impartial environmental controls and informing/training the population.
- Securing necessary funding and fostering collaboration with industries.

Authorities

- Evaluating the implementation costs associated with scaling up the process.
- Overcoming the challenges related to cooperation with neighbouring countries.
- Promoting the adoption and implementation of the process by all countries in the Mediterranean basin.
- Ensuring the validity and proper application of new technologies.
- Establishing robust methods for control and monitoring.
- Securing funding from the European Union and managing knowledge transfer and related costs.
- Sustaining efforts to improve technologies and addressing differences between EU countries and North African states.
- Striving for universal acceptance of monitoring approaches and fostering cooperation in monitoring the results.
- Addressing the removal of emerging pollutants and enhancing the RHE-Mediation technology for qualitative improvement of the water ecosystem.

Academia/Research

- Managing energy consumption associated with the process.
- Effectively handling a biomass rich in pollutants.
- Establishing synergies with stakeholders for better collaboration and support.
- Ensuring the acceptance of outcomes and results derived from the project.
- Ensuring the maintenance of pilot units for continued research and development.
- Addressing the lack of appropriate technological infrastructure in less developed countries.
- Providing reliable and safe results from research activities.
- Securing funding from the European Union and addressing the lack of environmental awareness and culture.
- Ensuring the effective use of pilot units for accurate research and assessment.

C4 Enabling capillary cleaning of all identifiable local HOT SPOTs through the technologies promoted by the RHE-MEDiation project can yield a range of potential global benefits at the Mediterranean level. These benefits according to the Greek Stakeholders include mainly improved ***Environmental Health, Enhanced Biodiversity, Healthier Marine Life, Sustainable Fishing Industry, Enhanced Tourism, Positive Economic Impact and International Collaboration and Cooperation*** (*Table 10*).

Table 10 : Greek Stakeholders TG statements on potential benefits for Mediterranean Sea through RHE-MEDiation.

GREEK STAKEHOLDERS	Water Utilities	Business	Authorities	Academia/Research
Environmental	fish stocks replenishment, cleaner seas, marine ecosystem improvement, pure lakes	cleaner seas, marine ecosystem, biodiversity, brand name hotspot, sense that things can change	cleaner seas, pollution reduction, marine ecosystem restoration biodiversity, protection of marine life, sustainability of the planet and human life	Environmental quality improvement, upgrading of natural resources, reduction of specific pollutants
Recreation/Leisure	swimming, cultural activities)	improve urban life		
Economic	fishing, area upgrade for business, tourism, attract investment, economic growth	fishing, area upgrade for business, tourism, attract investment, economic growth		production of bio-mass for the development of new products
Public Health				
Other		high quality research results, update on new technologies	implementation of the pilot system on a larger scale, replication of good practices, adoption of measures based on the level of pollution, management of information and responsibility for water protection	high quality research results, update on new technologies

4.2.1.2 2nd Survey for Greek Stakeholders

The second survey has been conceived to evaluate if the objectives and the message of RHE-MEDiation Workshop was clear among the Stakeholders. Therefore, it took place in real- time just after the RT and the results enabled further discussion at the last session of the Workshop. Moreover, it was shared with

additional Stakeholders in the following days from 04th to 23rd October to increase the number of stakeholder's participation and have a more representative 'sample'.

All together 37 stakeholders answered the questionnaire, the majority (40%) being from 'Water Utilities'. 'Authorities, impacted Business, Civic society,' 'Universities/Research' and ''Private Investors'' were also represented (8 -15 %), whereas the 'Water generating companies' had a minimum representation.

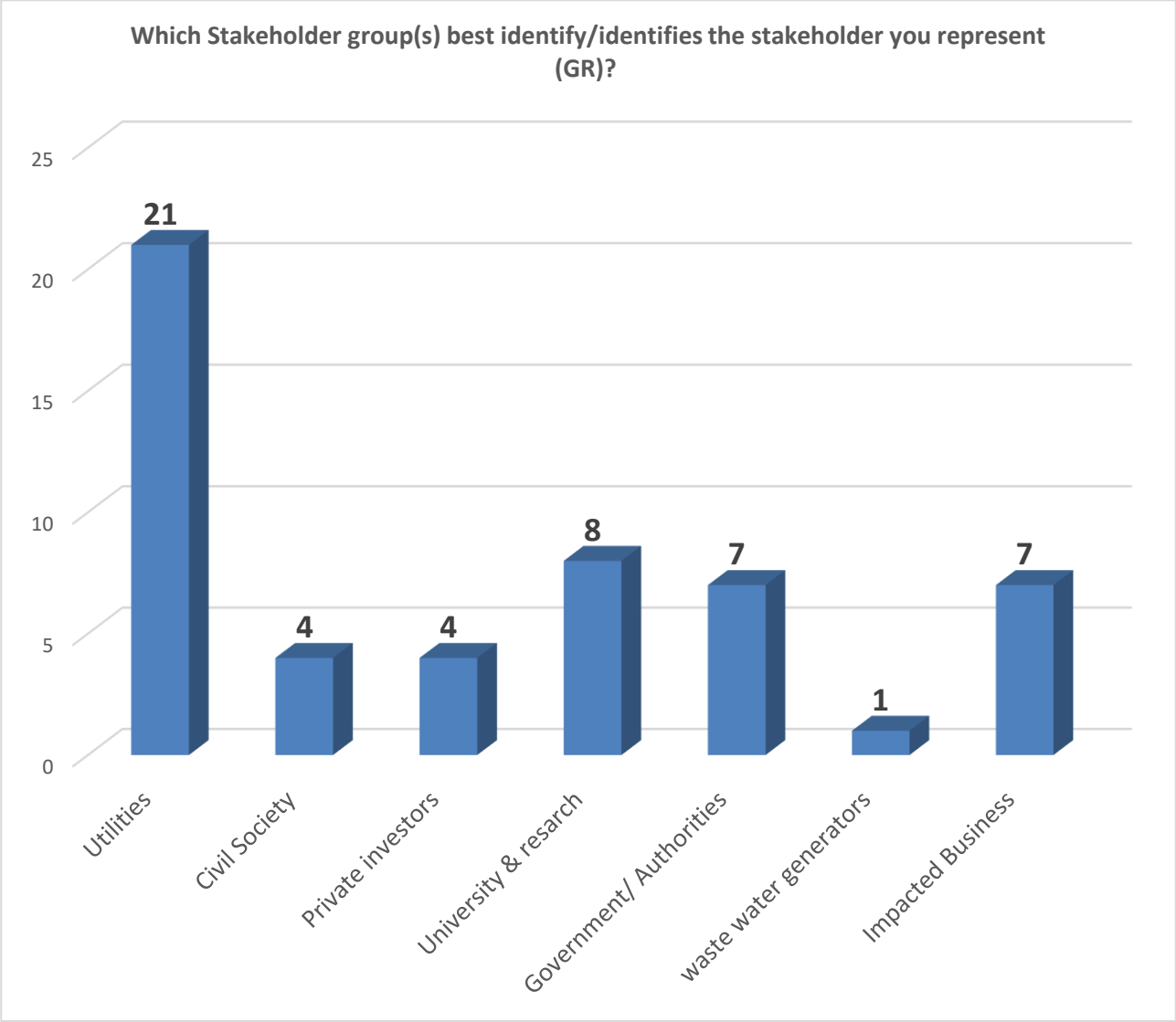


Figure 40 :High-level stakeholders' groups during the Greek Workshop.

Grouped per Target Groups (TGs) the majority (36%) belong to the 'Capital' TG with the rest showing an even representation (14-19%).

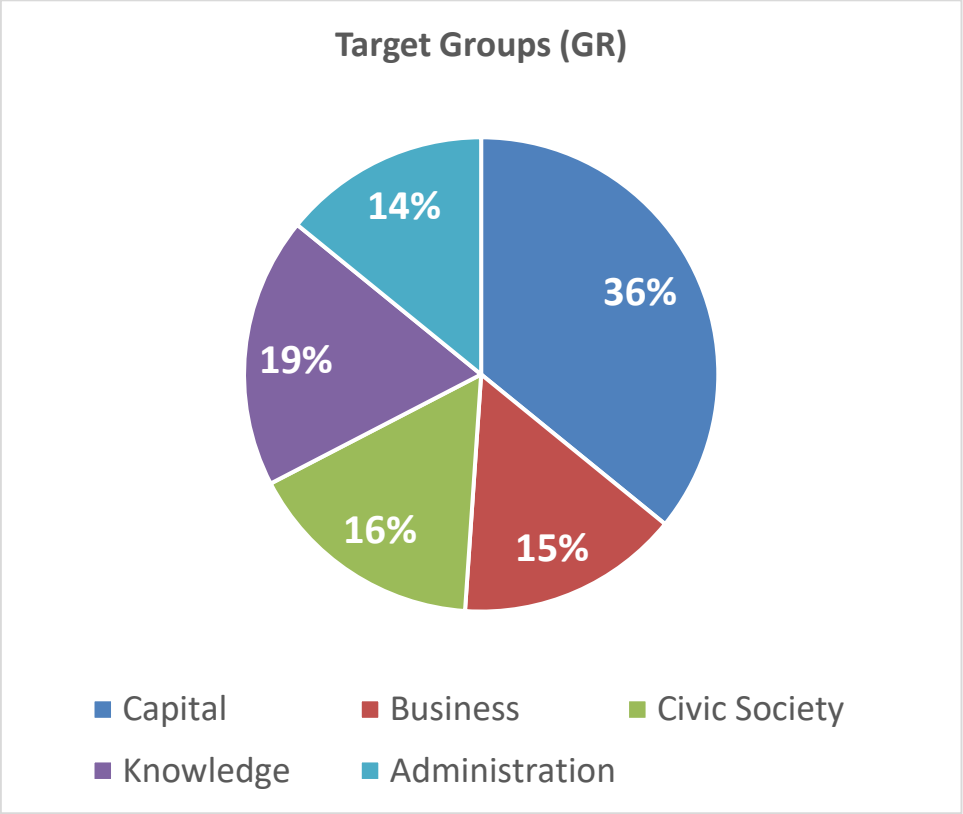


Figure 41 :Target Groups of Greek Stakeholders during the Greek Workshop.

Q3: Very interestingly the results to this question **showed that 70% (26 positive out of 37 answers) trust the EU MISSION goal as opposed to 35% (9 positive out of 25 answers) in the RT**. Although the participants of the RT were less than those of the 2nd survey (25 as opposed to 37), and based on the assumption that most of the 25 answered also the 2nd survey and as shown in *Figure 35* and *Figure 42*, ***one might argue that the deliberation during the RT discussions managed to inform and educate the Greek Stakeholders.***

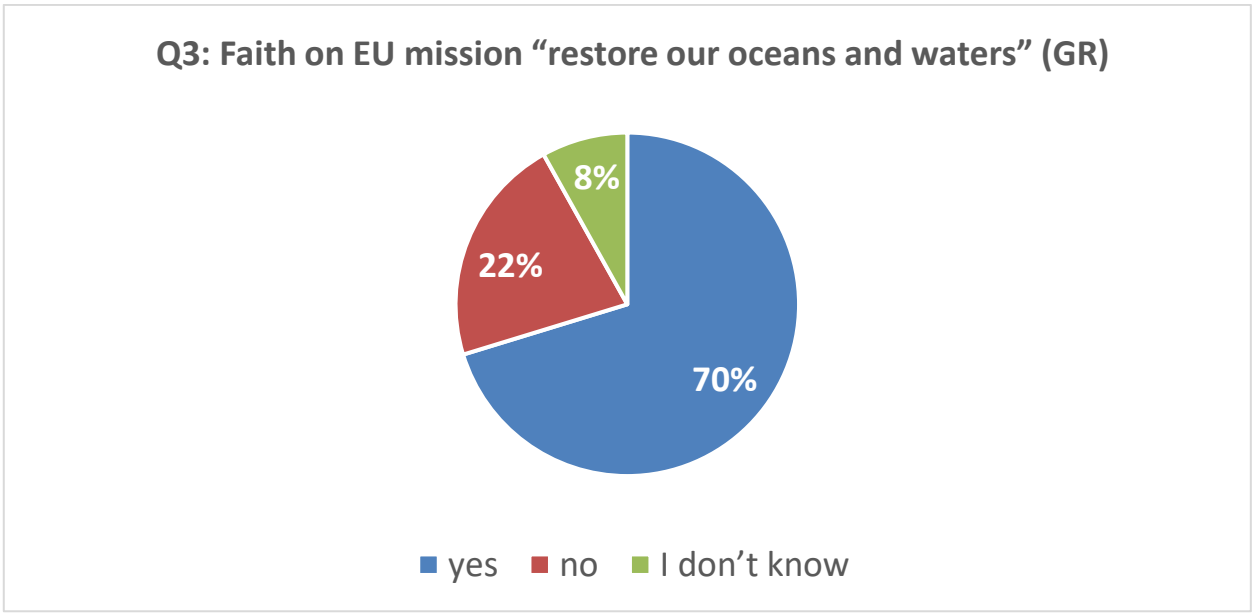


Figure 42 :Faith of Greek Stakeholders on EU mission “restore our oceans and waters” during the Workshop.

Table 11: Greek Stakeholders Target Groups faith on EU mission.

Greek Stakeholders	Capital	Business	Administration	Civic Society	Knowledge
yes	14	6	6	6	5
no	3	2	2	1	6
I don't know	2	0	1	0	0

'Knowledge' TG seems to be sceptic on EU mission, but all the other 4 TGs overwhelmingly provided a positive answer.

Q4: All the participants unanimously agreed that chemical pollution is a major problem in waters (same as during the RT). ***90% assigned it as a worldwide problem*** and only 8% believed it is of local importance. This differentiation is attributed mainly to the responses of the Administration group which understandably perceive the issue equally as a national issue too.

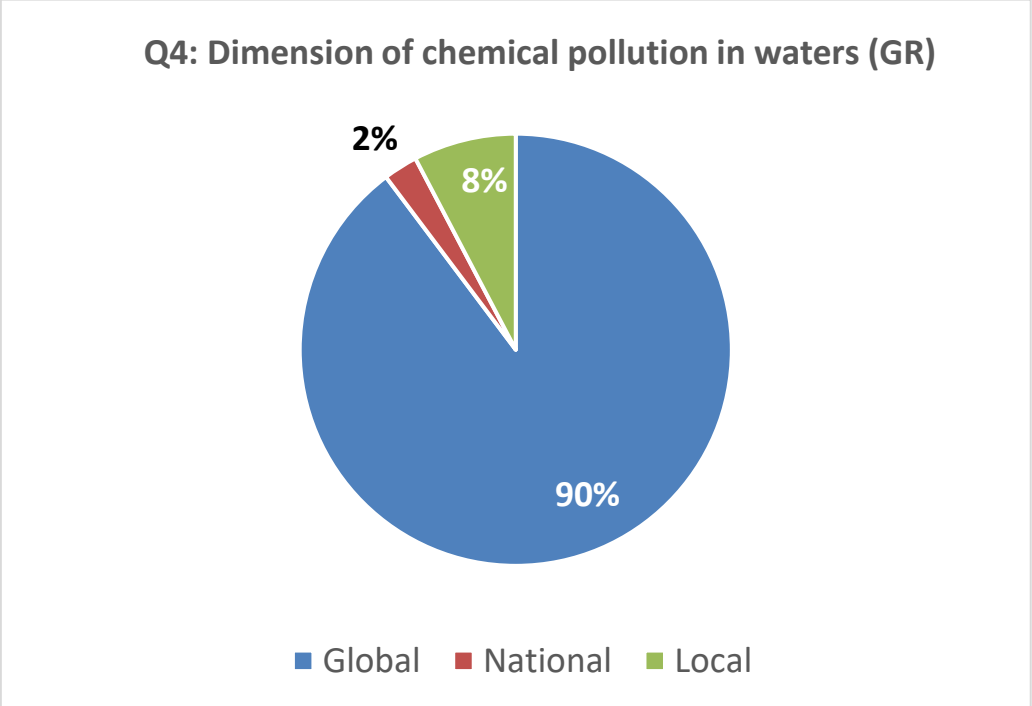


Figure 43: Greek Stakeholders about dimension of the chemical pollution in waters during the Workshop.

Q5: ***Less than the half of the stakeholders (46%) have confidence on the ability of the local authorities to mediate the issue taking advantage of the policy regulation*** and technological / scientific solutions available. As during the RT the majority of the stakeholders (68%) had confidence on local authorities, it can be argued that after the discussion they realized the importance of a more holistic approach. 'Capital' seems that do not trust local authorities (*Table 12*) but all the other 4 TGs overwhelmingly provided a positive answer (not surprisingly).

Table 12 : Confidence in local authorities of Greek Stakeholders during the Workshop.

Greek Stakeholders	Capital	Business	Administration	Civic Society	Knowledge
yes	5	**5**	**5**	**2**	**6**
no	**7**	4	0	1	4
I don't know	4	1	1	3	1

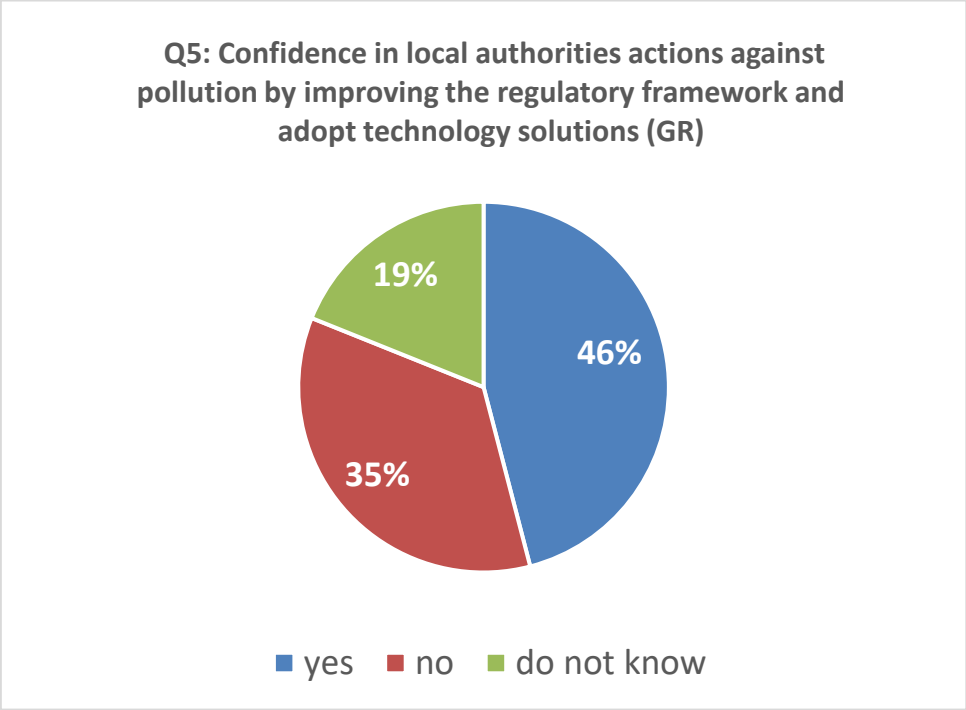


Figure 44 : Confidence in local authorities of Greek Stakeholders during the Workshop.

Q6: All participants (100%) agreed on the importance of having full transparency on the collected data.

Q7: Almost all participants (86%) agreed that RHE-MEDiation's technology can contribute to pollution-free HOTSPOTs. Interestingly most of the 'don't know' answers came from the 'Capital' TG.

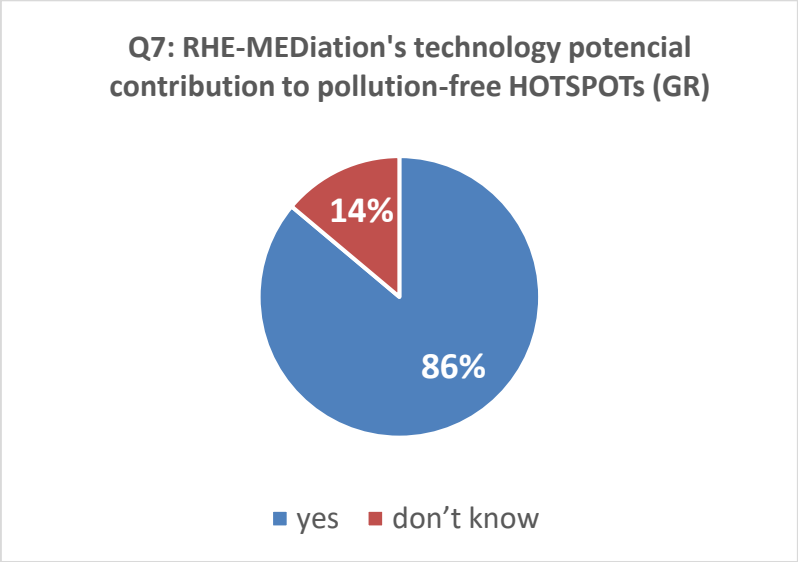


Figure 45 : Greek Stakeholders thoughts about RHE-MEDiation technology during the Workshop.

Q8: According to the survey results, ***97% of the participants expressed agreement with the idea that the incorporation of supplementary upstream measures***, such as the adoption of less polluting solutions, could effectively complement the initiatives of RHE-MEDiation's technology in tackling the identified HOTSPOT issues.

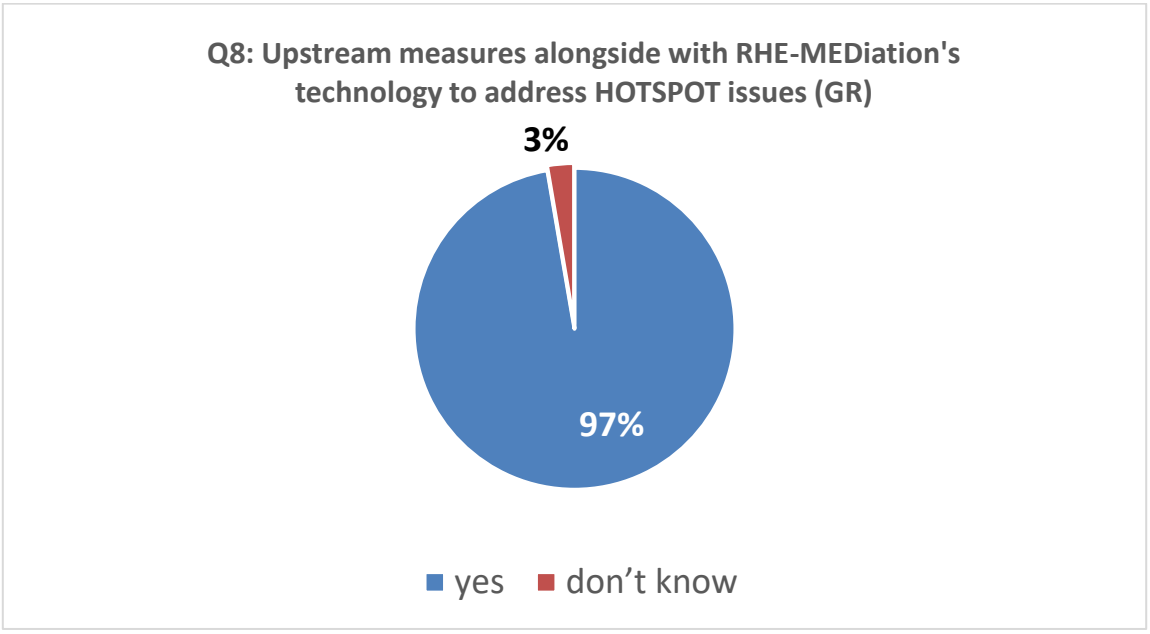


Figure 46: Greek Stakeholders thoughts about RHE-MEDiation technology along with upstream measures during the Workshop.

Q9: ***Can you suggest alternative solutions for addressing water quality pollution in HOTSPOTs aside from what RHE-MEDiation proposes?***

Greek Stakeholders (14 out of 37) suggested the implementation of preventive solutions by reducing pollution on-site:

I. Prevention at the source.
II. Monitoring, inform, Incentives for RHE-MEDiation adoption.
III. Restriction before entering WWTP.
IV. The appropriate solutions are those that combine the production of friendlier products, the awareness and information of consumers and the activation of local private and public agencies.
V. 1) Control of Pollution at the source, 2) Minimization of the content of PFAS and other emerging pollutants in consumer products, 3) Detailed cataloguing of products containing PFAS and emerging pollutants, informing the public about their use and disposal, 4) Higher treatment of liquid sewage from large sources such as pharmaceutical industries, hospitals, industries, 5) Research for alternative biodegradable chemicals or less dangerous and gradual replacement of dangerous ones, 6) Stricter control of industries, crafts, laboratories, hospitals, etc. uses in the phase of their connection to the sewage network.
VI. Very strict legal framework.
VII. Strict controls on industrial waste and bio-waste, more sustainable limits but to be respected.
VIII. Limiting the use of chemicals in consumer products.
IX. Stricter pollutant emission limits in treated liquid waste, more controls - measurements to observe limits by treatment plants, less use - production of substances that burden recipients with long-lasting and difficult to detect and remove - pollutant treatment.
X. Installation of membranes.
XI. Reducing the use of plastics.
XII. Prevention, information and awareness of citizens, treatment of sewage or pollutants at the source.
XIII. Stricter legal framework and systematic monitoring.
XIV. Monitoring of inflows into the sewer network from areas with a potentially high pollutant load, related to the type of activities in the wider area.

Q10: According to the workshop findings, 89% of the participants acknowledged that the workshop facilitated their comprehension of how they could contribute to RHE-MEDiation's long-term influence on the Mediterranean basin and its extended implications.

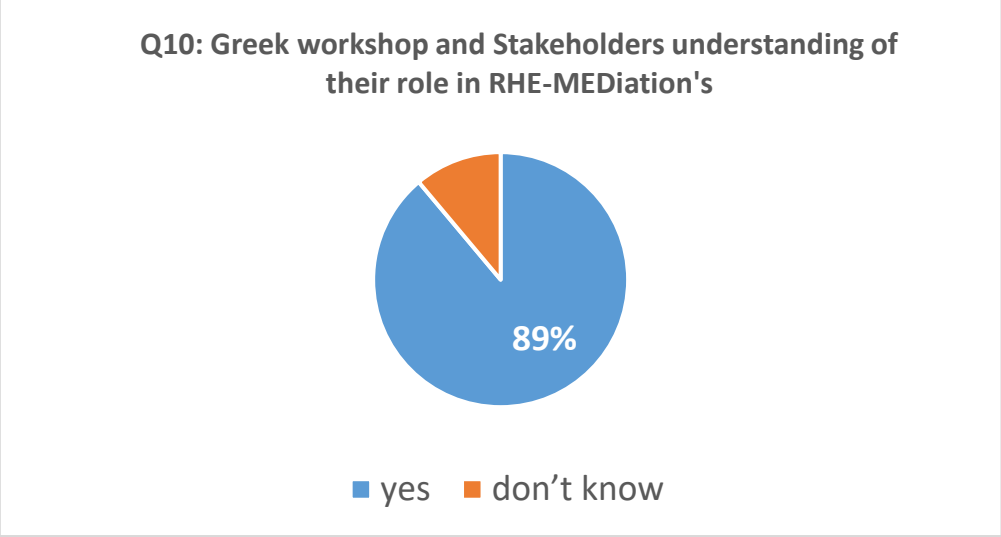


Figure 47 : Greek Stakeholders thoughts on workshop target during the Workshop.

Q11. The view on RHE-MEDiation's networking strategy is largely positive, according to the opinions of 89% of the respondents. None of the answers were negative (the other responses were 'don't know'). The strategy seems to effectively promote cooperation and involvement among stakeholders, thereby amplifying the project's overall influence and scope.

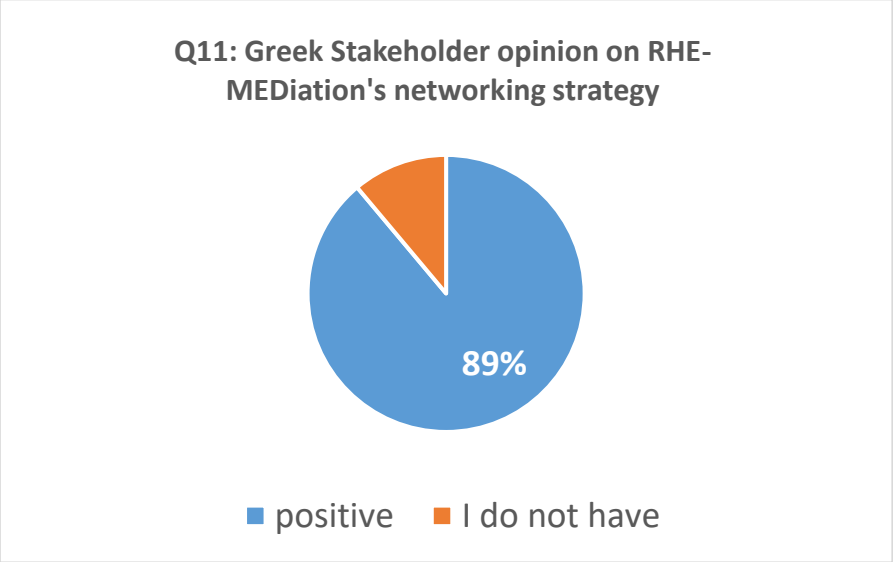


Figure 48: Greek Stakeholders thoughts on network strategy during the Workshop.

4.3 Italian Workshop on 11th of October 2023

On 11th October 2023, CNR organised the first RHE-MEDiation workshop to communicate and disseminate innovative RHE-MEDiation technologies and services to the Italian stakeholder network. The location of meeting was in University of Bari, Sede di Paolo VI, Taranto. Participants were informed about all research activities of the RHE-MEDiation project by the interventions of the project coordinator and CNR; thanks to the live connections with Greece and Turkey it was also possible to describe the implementation of the project in the other Mediterranean coastal states demo sites involved.

In order to establish a community of stakeholders from different backgrounds, as the project aims to do, the participants of the 11th October workshop pledged to remain actively involved in the project, contributing by disseminating information, lobbying decision-makers, sharing research data, all with the aim of supporting the project's objectives.

The introduction by the project coordinator, presentations on the Greek, Italian and Turkish demonstration sites and on the project's network strategy were followed by a round table with all participants, where they discussed further details about the project and reported back to the project team on the experiences of the stakeholder groups they represent. The roundtable discussion was conducted using targeted questionnaires, aimed to better engage stakeholders and assess their perspectives on the RHE-MEDiation project.

In the days following the workshop, the second online survey was conducted to evaluate the success of the workshop.

Figure 49: RHE-MEDiation Workshop for Italian Stakeholders, 11/10/2023.

4.3.1 Reflections on Italian Workshop

In order to create an Italian network of stakeholders, all interested parties were invited, but only two of the five target groups participated: local authorities, Universities and Research &Development Centres.

4.3.1.1 Round Tables (RT) results and discussion on Italian Workshop

The use of round-table discussions and targeted questionnaires is a useful method for engaging stakeholders and assessing their perspectives on the RHE-MEDiation project. Unfortunately, participation was rather low, due to a currently difficult local political situation and recently vacant positions that have not yet been replaced with others. However, all participants were keen to talk and exchange views, allowing for active participation and succeeding in fruitful discussions and comparisons.

The use of hard copies of the answers to the questionnaires that were provided to the participants not only ensures the documentation of the stakeholders' views, but also facilitates the analysis of their contributions to assess the current situation and feasibility of the project.

In order to understand the possible change in stakeholder perspectives during the course of the project, periodic evaluations will be conducted throughout the project life cycle. This will help capture any changes in stakeholder attitudes and assess the impact of implemented strategies on stakeholder engagement and support, improving the effectiveness of the RHE-MEDiation project and promoting a more inclusive and collaborative approach.

By prioritizing active stakeholder participation, the project demonstrates a commitment to inclusiveness and collaboration, which are essential to the successful implementation of initiatives with far-reaching environmental impacts.

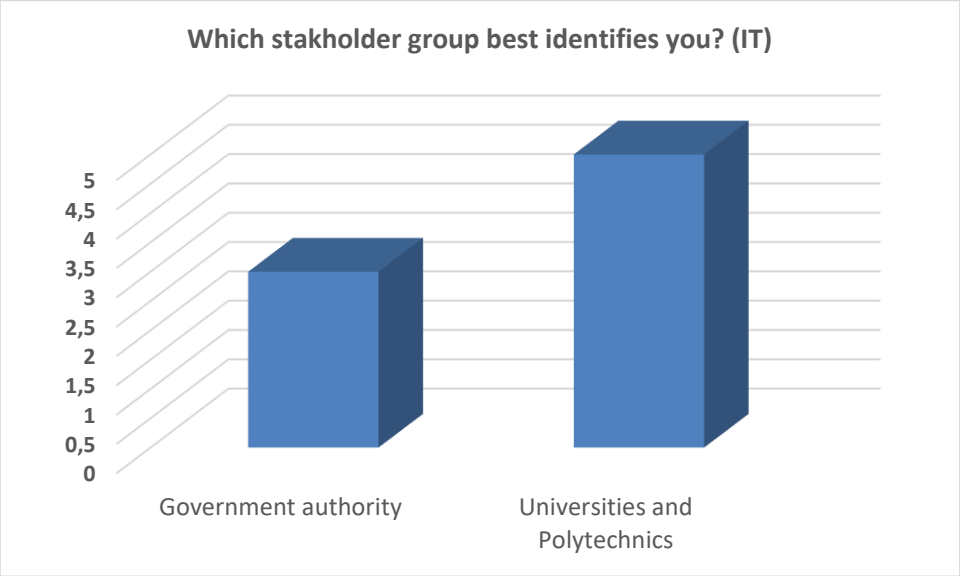


Figure 50 : High-level Italian stakeholders' groups that participated in Round Tables.

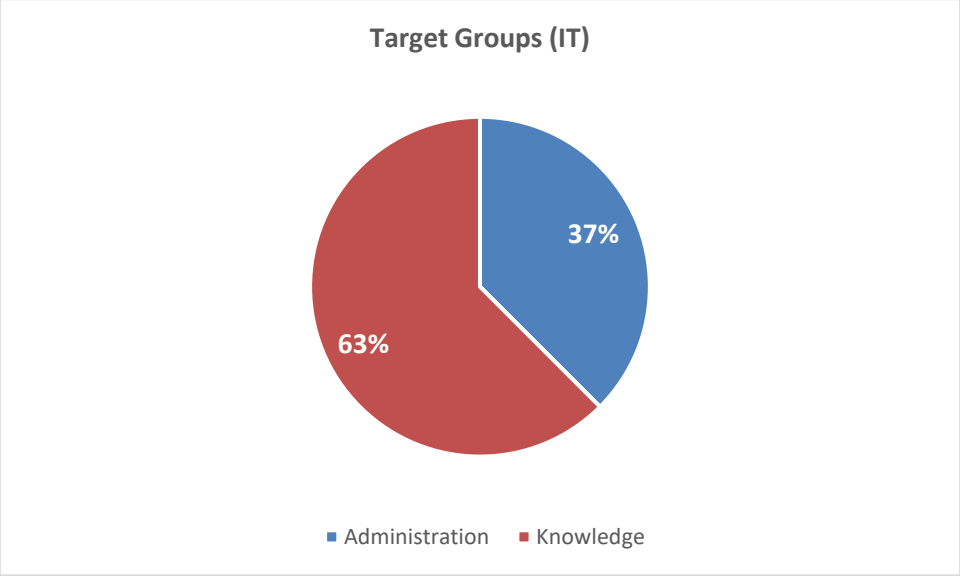


Figure 51 : Round Tables composition of Italian Stakeholders, per target groups.

The different composition of the participants in the meeting compared to the other states involved in this phase of the project, i.e., Greece and Turkey, also reflects the different type of demonstrator site considered in Italy: the "Mar Piccolo" demo site is a coastal basin whose waters and seabed in I Inlet are significantly contaminated with heavy metals, PAHs and PCBs.

A: QUESTIONS RELATED TO THE RESPONDENT'S GENERAL UNDERSTANDING OF THE PROBLEM

A1 The majority of participants (78 %) said they believe the EU mission's "restoring our oceans and waters" goal on pollution is achievable. Analysing the responses of the different target stakeholder groups, those who have an opposite opinion (22%) belong to the "Knowledge" group, justifying their choice on the basis of the presence of particularly recalcitrant compounds in the environment.

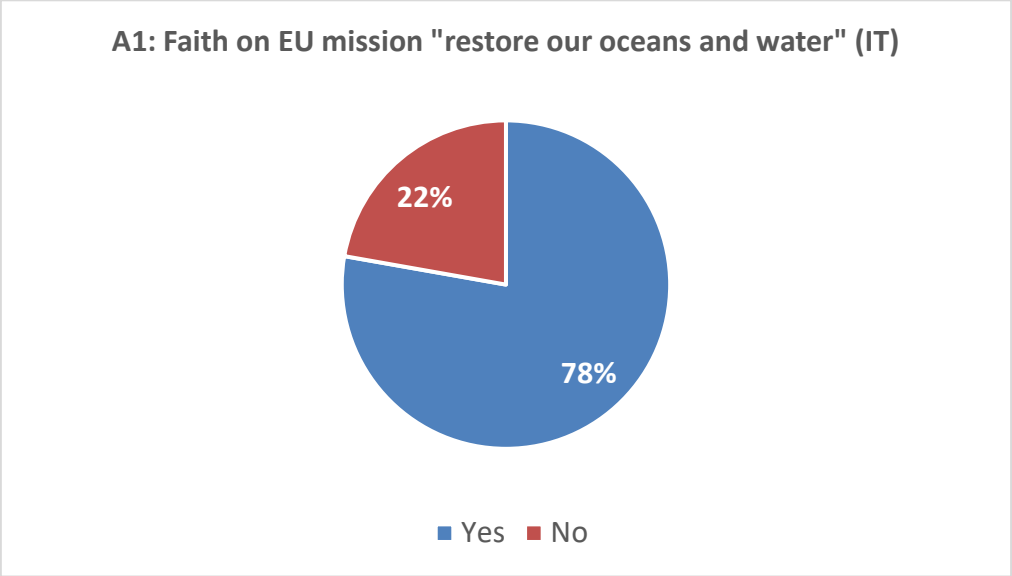


Figure 52 : Faith of Italian Stakeholders on EU mission "restore our oceans and waters".

A2 The answer given unanimously is that chemical pollution is a major problem in water and of global scale.

A3 The majority of stakeholders (71%) have confidence in the ability of local authorities to mediate the problem by leveraging policy regulation and available technological/scientific solutions, as government authorities are shown to be responsive to the input of the scientific community. The lack of confidence, at 29 percent, was indicated equally by both categories of stakeholders present, justifying it by the not always appropriate planning capacity of authorities.

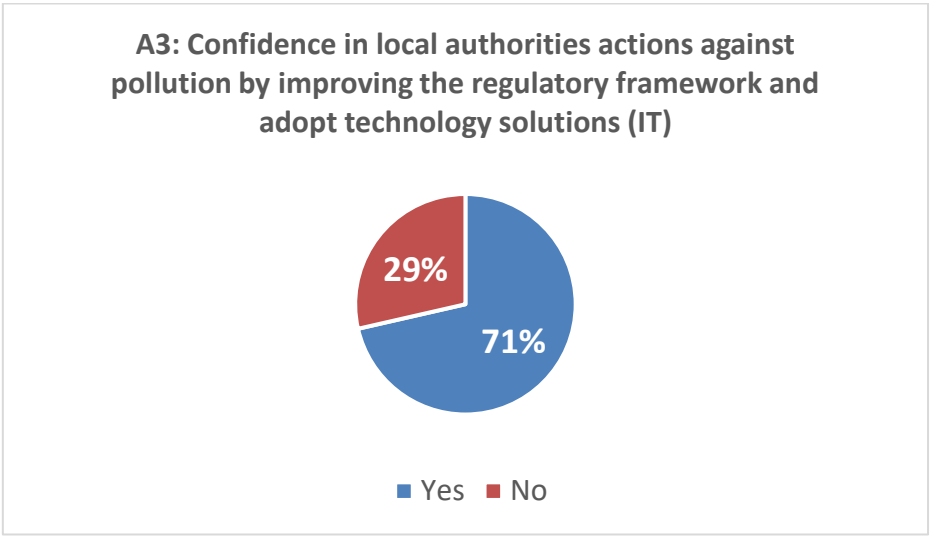


Figure 53 : Confidence in local authorities of Italian Stakeholders.

A4 Nearly all participants ***(87 %) agreed that it is important to have full transparency*** about the data collected, while 13 %, belonging to the "Knowledge" group, believe that, in any case, it is the enforcement of appropriate laws and regulations that can be most effective in reducing pollution.

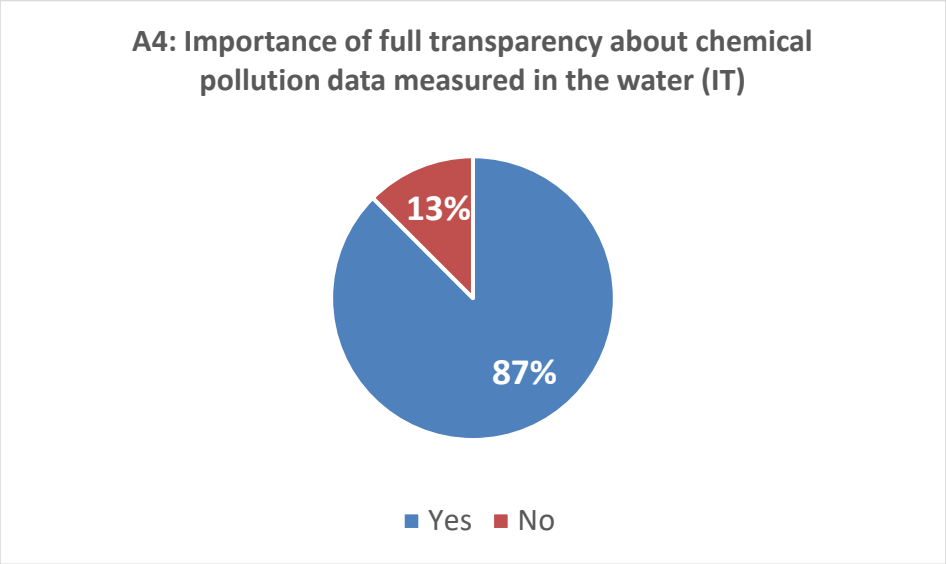


Figure 54 : Italian Stakeholders about transparency on pollution data.

B: QUESTIONS ADDRESSING SPECIFIC UNDERSTANDING OF THE RHE-MEDIATION POTENTIAL IMPACT BY THE RESPONDER

B1 The action proposed by the RHE-MEDiation project, using microalgae technology, was considered by all to be useful in mitigating the problems of HOTSPOTs, but incorporating additional measures is alos important.

B2 40% of participants said there are other feasible solutions, such as timely census and increased discharge controls or electricity-based technologies used in other areas of high environmental pollution.

B3 All agreed on the importance of the role of stakeholders for the project.

B4 Likewise, they all reiterated that the role of citizens is very important.

C: QUESTIONS FOCUSING ON CAPTURING THE PERCEPTION OF THE LOCAL CONTENT AND POTENTIAL UPSCALE EFFECTS BY THE RESPONDER.

The answers given by the Italian Stakeholders, can be grouped into five (5) categories:

1. **Environmental**
2. **Leisure & Recreation**
3. **Economic**
4. **Public Health**
5. **Other**

The following analysis is divided according to the different target groups and their responses:

C1 The answers of ***all Italian Stakeholders highlight the potential Economic and*** Public Health ***benefits for Taranto Bay*** through cleaning actions like the one of RHE-MEDiation. ***Environmental and Recreation/Leisure*** benefits are of secondary importance.

Table 13: Italian Stakeholders TG statements on potential benefits at local level of any chemical pollutants cleaning action.

ITALIAN STAKEHOLDERS	Authorities	Academia/Research
Environmental		Improvement of environment / water quality/ biodiversity/ ecosystem, conservation
Recreation/Leisure	Recreational use of water	
Economic	Fishing and aquaculture	Fishing and aquaculture/ Potential development of the areas
Public Health	Safety of locally produced food	Safety of locally produced food
Other		

C2 The perceived consequences in the long term if any action regarding the chemical pollutants in waters is not taken very soon in the area around the Italic demo-site were summarized in *Table 14*;

Table 14: Italian Stakeholders TG statements on Long-term consequences of chemical pollutants in waters if there is no action.

ITALIAN STAKEHOLDERS	Authorities	Academia/Research
Environmental	Environmental degradation	Impossibility of complete pollutants removal, Environmental degradation
Recreation/Leisure	Non-recreational use of waters	
Economic	Absence of catch	Removal of companies from the territory
Public Health	Deterioration in quality of life, Compromising food safety, Human health degradation	Bioaccumulation and diseases, Deterioration in quality of life, Health impairment, Compromising food safety
Other		

C3 The potential challenges forecasting during scaling up of the RHE-MEDiation cleaning process to Italy or other states in the Mediterranean basin are summarized in *Table 15*.

Table 15: Italian Stakeholders TG statements on potential challenges expected during the extension of the RHE-MEDiation cleaning process.

ITALIAN STAKEHOLDERS	Authorities	Academia/Research
Environmental	Implementation of environmental awareness, Recontamination	Promote monitoring and remediation in areas with different characteristics

Recreation/Leisure		Social involvement
Economic		Social involvement
Public Health		
Other	Cooperation with low-tech states	Local authority involvement,

C4 The potential global benefits at Mediterranean level imagined by enabling capillary ***cleaning of all identifiable local HOT SPOTs*** through the technologies the RHE-MEDiation project are summarized in *Table 16.*

Table 16: Italian Stakeholders TG statements on potential benefits for Mediterranean Sea through RHE-MEDiation.

ITALIAN STAKEHOLDERS	**Authorities**	**Academia/Research**
Environmental	Preservation of environmental resources	Preservation of environmental resources
Recreation/Leisure		
Economic		
Public Health	Public health protection	Public health protection
Other		Promotion of new monitoring and remediation systems, also in areas with different characteristics

Summing up, the potential benefits at the local level of any action to reduce chemical pollutants, such as those suggested by the RHE-MEDiation project, for people and organisations in the area around the demonstration site have been identified as the increased safety of food production, improvements in ecosystem health and greater protection of human health; failure to act would therefore mainly lead to an impact on the food production sector, and thus on health and quality of life.

The extension of the RHE-MEDiation clean-up process in Italy or in other Mediterranean basin states could lead to greater awareness of environmental sustainability issues even in countries where these are not central issues in political or funding choices, leading to the involvement of local authorities on issues that would probably not have been addressed, leading, as a longer-term effect, to an improvement in environmental quality and, consequently, public health.

4.3.1.2 2nd Survey for Italian Stakeholders

The second survey, delivered immediately after the conclusion of the meeting, aimed to understand whether the objectives and message of the RHE-MEDiation Workshop were clear among the Stakeholders.

The data was collected in the days following the meeting. The survey was drawn up on Microsoft Forms (https://forms.microsoft.com/) and sent via email to the stakeholders:

The stakeholders who responded to the survey mainly belong to the knowledge category (universities, polytechnics and research centres, 75 %), and the rest belong to the government authority's category (25 %).

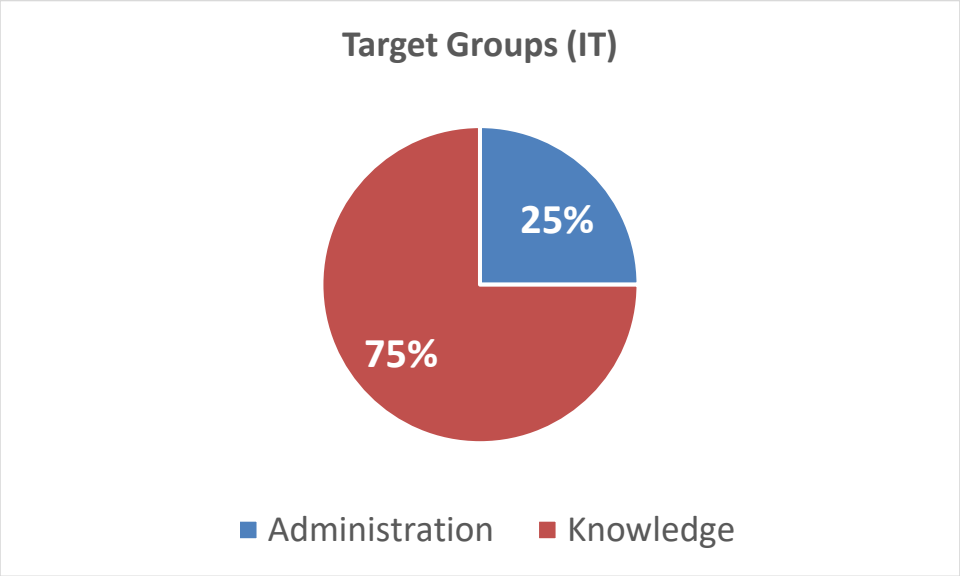


Figure 55: Target Groups of Italian Stakeholders answered to the 2nd Survey.

All stakeholders confirmed their confidence in achieving the objective of the EU mission and the consideration of the global nature of the chemical pollution problem.

Only half of survey respondents, from both categories of stakeholders who responded, have confidence that local authorities can effectively manage the removal of chemical pollutants from water through regulatory improvements or technological solutions, and even for the other responses, no differentiation can actually be made based on the group they belong to.

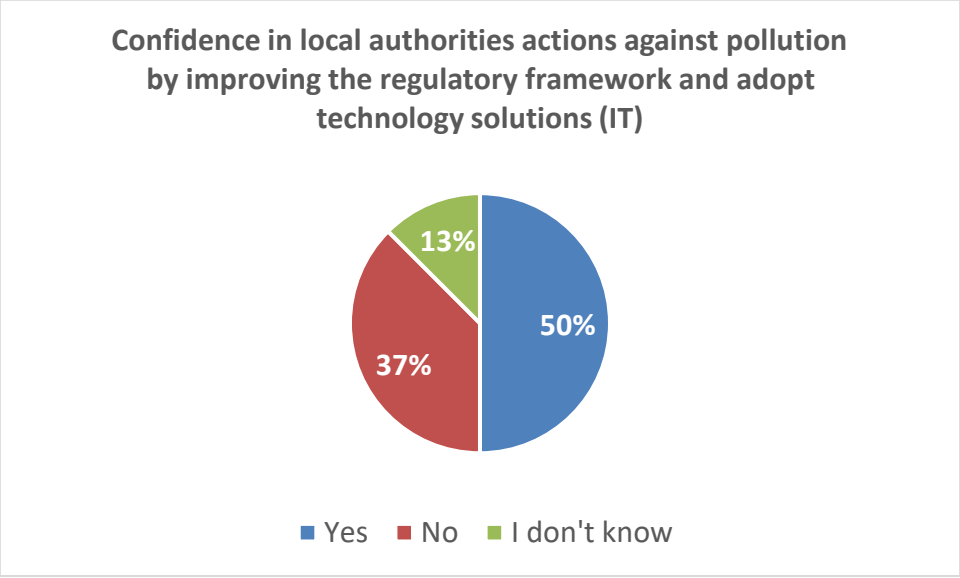


Figure 56 : Confidence in local authorities of Italian Stakeholders after the Workshop.

The majority (87%) believe that greater awareness of chemical pollution data would make people more confident in cleaning up polluted areas, 13%, belonging to the "Knowledge" TG, cannot give an answer.

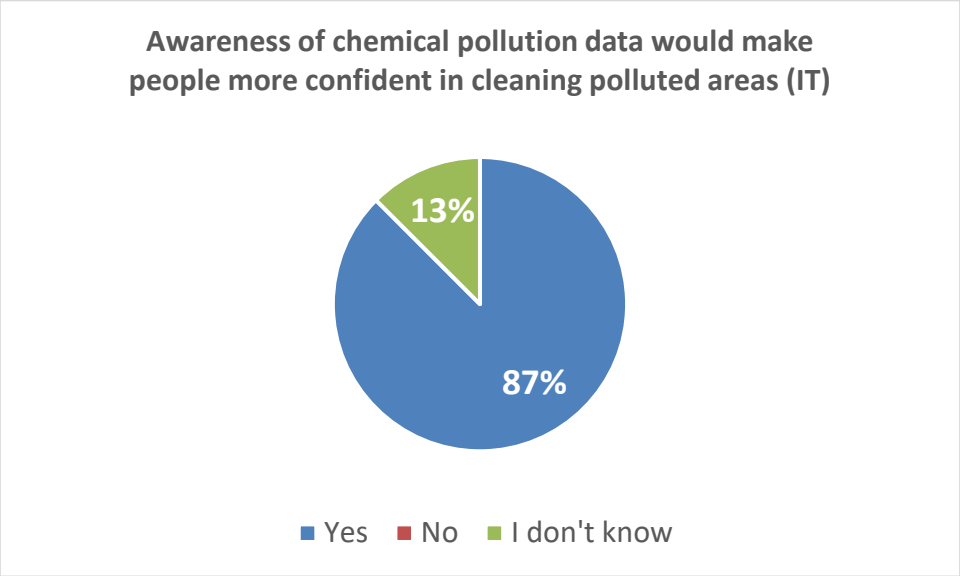


Figure 57 : Consequence of chemical pollution awareness of Italian Stakeholders after the Workshop.

Again, the same percentage (87%) thinks that the technology proposed by the RHEM-EDiation project could actually help free hotspots from pollution, while 13%, composed by Research centre, is not able to give an answer. 75% of respondents believe that additional upstream measures (e.g., substitution with less polluting solutions) need to be added alongside RHE-MEDiation technology to address the problems of HOTSPOTs.

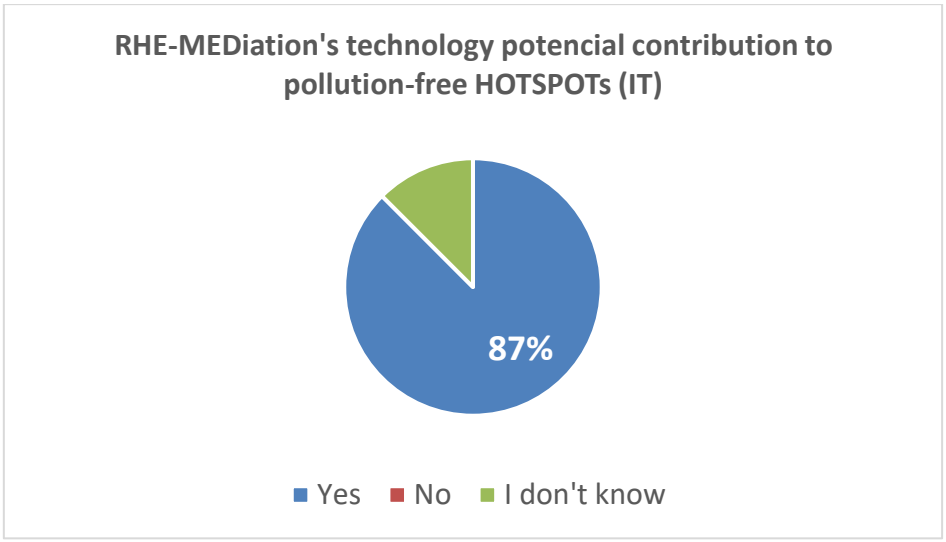


Figure 58 : Italian Stakeholders thoughts about RHE-MEDiation technology after the Workshop.

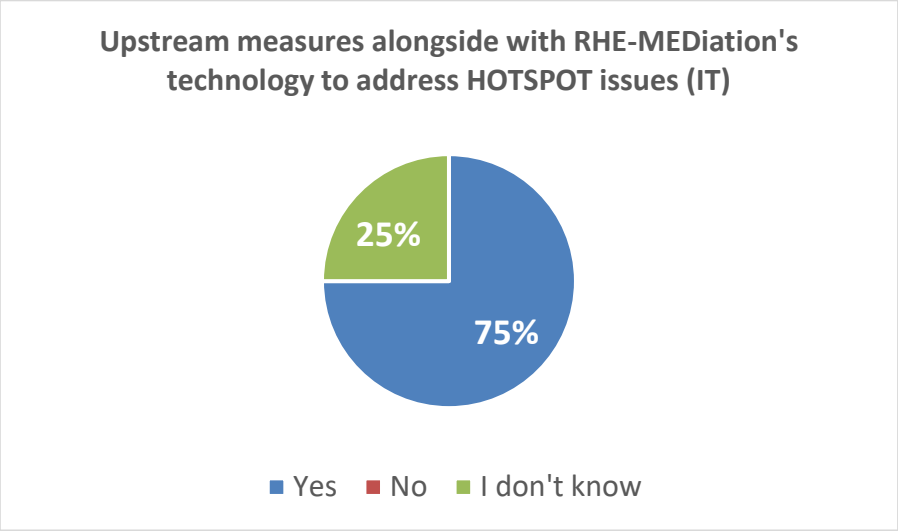


Figure 59 : Italian Stakeholders thoughts about RHE-MEDiation technology along with upstream measures after the Workshop.

For all the participant the workshop provided a clear understanding of their role in the lasting impact of RHE-MEDiation on the Mediterranean basin and beyond, during or after its completion, and equally for all the opinion on the networking strategy of the project is certainly positive.

Regarding the results of the second survey, it is interesting to note that all participants were confident that the objectives of the EU mission to reduce pollutants in the sea by 50% would be achieved, 87% of the participants believed that the RHE-MEDiation technology can help rid the HOTSPOTs of pollution and 100% that the workshop provided a clear understanding of the role of stakeholders in the lasting impact of RHE-MEDiation on the Mediterranean basin beyond, during or after its completion. This means that the project is considered interesting, useful and also feasible to achieve the identified objectives.

Comparison with round tables

Participation in the round table was followed in the following days by the completion of the second online survey, which saw an increase (from 63% to 75%) in the participation of the 'knowledge' component as opposed to the 'government' component, which fell from 30% to 25%, while no citizenship component responded and participated in the meeting, despite having completed the first survey.

5 SYNTHESIS AND CONCLUSIONS

5.1 1st Survey

The first survey was essential to comprehend the level of interest and scope of engagement among our stakeholders as defined by the project's objectives. Any misalignments in the original perceptions at the planning stage (set in D1.1) needed correction through appropriate actions. Prior to the workshop, only a limited number of surveys were collected, and although not exhaustive, the findings provided valuable insights.

Within the Capital target group, a lower interest from Investors and Financial Institutions was anticipated due to the project's lack of exploitable results at this stage. Despite these expectations, a moderate level of interest was observed. Similarly, survey results for the Administration target group unveiled a heightened level of interest among policymakers compared to the initial anticipation during the planning phase. Survey results also indicated that citizens and civil societies' actual level of interest falls within the expected range. The Knowledge target group exhibited a high level of interest; however, additional efforts are required to further stimulate interest in this group. Regarding the Business target group, collected data indicated that the interest level aligns well with expectations.

In terms of stakeholders' chosen modes of engagement, 'informed' and 'collaborate' were the most preferred. Nevertheless, some water and wastewater utilities and policymakers requested the 'informed' level of engagement. The project should engage with these stakeholders to enhance their participation.

In *Table 17, results of the 1st survey are presented synthesised for the three demo-sites.*

Table 17: Main results from the 1st survey – invitation of Stakeholders.

		GREECE	ITALY	TURKEY
1st survey				
Participants		**14**	**10**	**45**
Q1	Stakeholder Group	CAPITAL 50%	KNOWLEDGE 50%	CAPITAL (34%), ADMINISTRATION (34%)
Q2	Level of interest	HIGH 64%	HIGH 70%	HIGH 58%
Q3	Scope of participation	Environmental protection 29%	Environmental protection 36%, Improve synergies 36%	Project is under domain services 26%
Q4	Reason of participation	INFORMED 72%	BECOME PART 33%	INFORMED 34% NETWORKED 34%

5.2 Demo-Site's Workshops

Three Workshops, organized in **Italy, Turkey and Greece**, focused on WP1 and especially on T1.2 '*Development collaborative actions with local stakeholders to design the demo-site evolution*'. In order to establish the RHE-MEDiation high-level Stakeholders Group all the interested parties were invited (*Table 17*). The main aim was to investigate the ability of various Stakeholders, to take up the RHE-MEDiation tools, technologies and services, and in which context those tools will be promoted to those groups. Besides, the Workshop, with Round Tables (*Table 18*), focused on engaging the people required in the future to deliver needs of remediation, its governance and evolution of the demo sites, as a pilot experience to replicate through all authorized WWTP in the countries.

1st Workshop in Italy

The Italian demonstration site differs from the other demo-sites in that the treatment action will not be carried out on the effluent wastewater but in seawater and sediments in the Citrello canal that flows into the natural basin of the Mar Piccolo. This difference is reflected in the type of stakeholders involved, with a greater participation of the governmental / administrative component and that of research (especially the academic world). In fact, these are the two types of stakeholders that have always contributed to the management of an impacted environment and for which different types of studies have been carried out to assess different types of treatment. Certainly, this information provides an input to broaden the type of stakeholders to be involved, targeting beyond the citizen and productive activities, primary and secondary sectors.

The results obtained during the three activities conducted, the first and second online surveys and the round table, show that there is hope and confidence in the possibility of a significant reduction of pollutants in the marine environment. It also revealed that there is a solid awareness that citizens, stakeholders and the world of research must necessarily communicate and act, each for their part and function, to effectively achieve an improvement in environmental quality and thus greater safety for public health, and a better quality of life. The RHE-MEDiation project was therefore perceived as a valuable opportunity to develop not only synergies and networking to achieve the objectives of the EU directive, but also as a possible new and effective strategy for both monitoring and reducing pollutants.

1st Workshop in Turkey

The 75 attendees of Turkish Workshop demonstrated a high interest and curiosity on many details about the project. They were representing the various organizations including governmental, research facilities, private sector, universities, NGO's and investors that would give RHE-MEDiation partners the opportunity to conduct appropriately the project and to achieve it's targets. Suggestions, criticisms and all concerns were taken during the 1st survey and the workshop (round table and 2nd survey) discussions. All target groups have a positive approach to project targets and tools. Especially, algal bioreactor technology was the one attracted the most attention. Besides the positive ideas, stakeholders had also doubted about required area, treatment capacity in terms of flowrate and operational challenges of algal bioreactor technology. However, most of participants were convinced and satisfied for aims of the project. Overall responses were positive and essential part of stakeholders showed concern for reducing pollution in our inland and seawaters.

1st Workshop in Greece

In Greece, the Workshop was successful, with adequate level of participation (more than 40) and representation (which can be improved in the future) that allowed stakeholders to unfold their knowledge on the field of pollution and in WWTP effluent pollution in particular and express their ideas on its abatement and provide useful feedback to the achievement of the goals of the project. The discussion among high-level Stakeholders triggered some important points in terms of exploitation and the RHE-MEDiation services which are most suitable for application in Greece:

- In Greece RHE-MEDiation technology is not used for wastewater treatment. It is a new technology that mainly Wastewater Utilities and Stakeholders from Businesses and Administration are willing to see their applications.
- There was an increased interest among Stakeholders on the range of RHE-MEDiation services.
- Refinement and upgrade of the Greek Stakeholder Network, that needs to be considered when demonstrating RHE-MEDiation technologies and solutions in WWTP of Thriasio.

The discussion also focused on the particular demo case of Elefsis Bay, which is the Greek application area of the project. The stakeholders discussed the case in order to:

- Discuss the challenges that are currently faced in the Hot Spot and how the monitoring process is currently carried out
- Think of new solutions based on the RHE-MEDiation tools and services
- Develop their thinking on what the monitoring planning would look like so as to inform all the citizens
- Challenging the Elefsis area and the RHE-MEDiation delegates to consider what innovations on monitoring could be considered.

Table 18: Main results from the Round Tables during the Workshops.

		GREECE	ITALY	TURKEY
Round table				
Participants		**25**	**8**	**60**
A	Main target Group	CAPITAL 40%	KNOWLEDGE UNIVERSITY 63%	CAPITAL 42%
A1	Faith on EU mission "restore our oceans and water"	NO 65%	YES 78%	NO 100%
A2	Dimension of chemical pollution in waters	GLOBAL 79%	GLOBAL 100%	GLOBAL (5 out of 6 table)
A3	Confidence in local authorities' actions against pollution	YES 68%	YES 71%	YES 100%

A4	Importance of full transparency about chemical pollution data	YES 96%	YES 84%	YES 100%
B1	*additional measures need to be incorporated into the action*	Additional measure needed 96%	Additional measure needed 100 %	Additional measure needed (4 tables out of 6)
B2	*Can you envision any other viable solutions in the HOTSPOTs?*	YES	YES 40%	YES 100%
B3	*What should be the role of each stakeholder?*	IMPORTANT 100%	IMPORTANT 100%	IMPORTANT 100%
B4	*What should be the role of Citizens for the project to succeed?*	IMPORTANT 92%	IMPORTANT 100%	IMPORTANT 100%

Table 19 : Main results from the 2nd survey as indicator of a successful Workshops.

		GREECE	**ITALY**	**TURKEY**
2nd survey				
Participants		**37**	**8**	**45**
	Target Group	CAPITAL 36%	KNOWLEDGE 75%	ADMINISTRATION 37%
Q3	Faith on EU mission "restore our oceans and waters	YES 70%	YES 100%	NO 56%
Q4	Dimension of chemical pollution in waters	GLOBAL 90%	GLOBAL 100%	GLOBAL 89%
Q5	Confidence in local authorities' actions against pollution	YES 46%	YES 50%	YES 91%
Q6	Would transparency in chemical pollution data make people more confident in the remediation of polluted areas?	YES 100%	YES 87%	YES 96%
Q7	RHE-MEDiation's technology potencial contribution to pollution-free HOTSPOTs	YES 86%	YES 87%	YES 80%

Q8	Do you think additional upstream measures are needed?	YES 97%	YES 87%	YES 96%
Q9	Alternative Solutions in HOTSPOTS	Section 4.2.1	Section 4.3.1	Section 4.1.1
Q10	Did the workshop provide a clear understanding of your role in RHE-MEDiation's ?	YES 89%	YES 100%	YES 87%
Q11	**What is your opinion on RHE-MEDiation's networking strategy?**	POSITIVE 89%	POSITIVE 100%	POSITIVE 93%

5.2.1 Synthesis of Findings of RHE-MEDiation 1st Workshops

General findings

- ***The stakeholder Workshops were characterized by diverse representation of target groups*** (TGs), of qualified professionals that showed a high degree of interest and provided valuable insights and suggestions.
- Stakeholders demonstrated ***a sensitivity to environmental protection***.
- ***Transparency and open access to data*** (and implicitly citizen empowerment) are important in transforming SHs into part of the project
- ***SHs and Citizens can Play an important role*** with interesting proposals
- Varied responses among ***different TGs provided insights into effective stakeholder engagement strategies***.
- *SHs believe that the aim of the **EU MISSION "restore our oceans and waters" on pollution is feasible**. This belief **significantly increased*** following the stakeholder events and discussions, indicating a positive shift in confidence.
- ***RHE-MEDiation proposed technology appealed as satisfactory to remediate the WWTP pollution*** to the vast majority of the SHs.
- ***Confidence in the effectiveness of local authorities' actions against pollution*** through regulatory improvements and technology adoption us haigh but saw a decline, suggesting the need for further clarification and engagement with stakeholders.
- Overall, Workshops were successful in promoting the issue addressed and facilitated the SHs active engagement in to the project

Enabling capillary cleaning in the local HOT SPOTs through the technologies promoted by the RHE-MEDiation project can yield a range of potential global benefits at the Mediterranean level. ***These benefits include***:

1. Improved Environmental Health: The systematic removal of chemical pollutants from the identified HOT SPOTs can significantly enhance the overall environmental health of the Mediterranean, leading to cleaner water bodies and improved ecological balance.

2. Enhanced Biodiversity: The reduction of chemical pollutants in the identified local HOT SPOTs can help in preserving and promoting biodiversity, allowing the recovery of various aquatic species and the restoration of delicate ecosystems in the Mediterranean.

3. Healthier Marine Life: By addressing pollution at the capillary level, the project can contribute to the restoration of healthier marine life, fostering the recovery of fish populations and other marine organisms that are critical for the region's ecological stability.

4. Sustainable Fishing Industry: The removal of pollutants can lead to cleaner and more sustainable fishing grounds, supporting the long-term viability of the fishing industry and ensuring a stable source of income and food for local communities.

5. Enhanced Tourism: Cleaner and more pristine marine environments can attract more tourists, leading to a boost in the tourism industry in the Mediterranean region. The promotion of ecotourism and sustainable travel practices can further contribute to the overall economic growth of the region.

6. Positive Economic Impact: The project's successful implementation can have a positive economic impact on various sectors, including fisheries, tourism, and related industries, fostering regional economic growth and stability.

7. International Collaboration and Cooperation: The collaborative nature of the project can foster greater collaboration and cooperation between countries in the Mediterranean region, leading to the establishment of joint frameworks for addressing common environmental challenges.

8. Enhanced Global Environmental Reputation: Successful implementation of the RHE-MEDiation project can enhance the global environmental reputation of the Mediterranean region, positioning it as a leader in sustainable and innovative environmental practices.

9. Long-Term Sustainability: By addressing capillary pollution at the local level, the project can contribute to the long-term sustainability of the Mediterranean ecosystem, ensuring that future generations can continue to benefit from its resources and natural beauty.

A detailed analysis of the Round Tables' results and discussions from each workshop presenting the actual Stakeholder inputs more thorough can be found in Section 4 of the report.

5.2.2 Interesting remarks

The comparison between the questions addressed in the Round Table and those in the second survey provides valuable insights into the evolution of stakeholders' perspectives and beliefs over the course of the RHE-MEDiation project. By examining the changes in responses, we can gauge the impact of stakeholder engagement activities and the effectiveness of information dissemination during the project's various stages. This comparative analysis helps in understanding how stakeholders' knowledge and attitudes have been shaped and influenced by their active participation and discussions. It also underscores the importance of ongoing dialogue and education in fostering informed decision-making and collaborative problem-solving within the project's scope.

The faith of the SHs to the success of the EU MISSION has increased. In the case of Greece, the majority of the participants (65%) in the 1st survey stated that the do NOT believe that the aim of the EU Mission “restore our oceans and waters” on pollution is feasible. However, this belief changed after the 2nd survey and the

discussions, and the majority expressed their faith to the MISSION success (70%). Similar findings are recorded also in the IT case where the confidence increased. In the case of TR the 'faith' remained negative (56%), however a significant increase on positive answers (from 0% to 40%) was observed. However, it is essential to recognize that the main reason for the negative appraisal was the timeline being too short to achieve the goals (by 2030), emphasizing the significance of continued efforts and effective strategies to achieve the mission's goals.

On the contrary the '**Confidence in local authorities' actions against pollution by improving the regulatory framework and adopt technology solutions**' has decreased. Similar findings are recorded also in the TR and IT cases (although the decrease in TR is smaller).

Both these findings (taking into account the different audience in the three Workshops) **one might argue that the deliberation during the RT discussions managed indeed to inform and educate the stakeholders.**

5.2.3 Comparison across national workshops

The stakeholders group showed different synthesis across the countries, with different Target Groups being the most numerous ones. This is also reflected on the different statement the national surveys and Round Tables on the scope and reason of participation.

However, it is interesting that in all 3 countries the environmental protection was the main scope of their participation (scoring the highest (GR and IT) or closely second (TR).

The main difference was the response to the question on the 'Faith on EU mission "restore our oceans and water' GR (after the 2nd survey where the original 'no' was refuted) and IT seems to believe that statement whereas TR do not (for the reason explained above, too tight timeframe). Nevertheless, it is remarkable the TR misbelief dropped significantly (from 100 to 56%) after the 2nd survey and the discussion that preceded it.

It is worth mentioning the very high degree of TR SHs on the 'Confidence in local authorities' actions against pollution' which exceeds by far the relative figures in GR and IT.

5.3 Conclusion

The overall SH engagement framework and strategy proved to be effective and succeeded in identifying the level of interest of SHs, attracting their attention, engage them and derive valuable conclusions.

Workshops were successful, with adequate level of participation and representation (which can be improved in the future) that allowed SH to unfold their knowledge on the field of pollution and in WWTP effluent pollution in particular and express their ideas on its abatement and provide useful feedback to the achievement of the goals of the project. Country-specific findings were extracted along with the broader implications they have for the RHE-MEDiation project and the EU's mission to Restore our Oceans and waters by 2030.

Examining the different approaches applied in the different countries / sites to invite and involve the SH also provide useful lessons on the way they should be approached in the future events taking into account the country specificities, and the envisaged role and interest of the SH.

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ANNEX A

Figure 60 :1st Survey results in the Italy demo-site for level of interest (Figure 17) and Influence interest matrix (Figure 18) comparisons.

No.	TG	HLS	Stakeholder ID	Interest level (Avg)	Anticipated level of engagement RHE-MEDiation	
					Within the project	with similar initiatives
1	Administration	Authorities	AA1-IT	Medium	Become part	
2	Capital	Public investors	CC1-IT	High	Become part	
3	Knowledge	Universities	KA1-IT	High	Become part	
4	Knowledge	Research and development centres, including national and local laboratories	KB1-IT	High	Become part	

Figure 61 : 1st Survey results in the Greece demo-site for level of interest (Figure 17) and Influence interest matrix (Figure 18) comparisons.

No	TG	HLS	Stakeholder ID	Interest level (Avg)	Anticipated level of engagement RHE-MEDiation	
					Within the project	with similar initiatives
1	Administration	Government Authorities	AA1-GR	Medium	Informed	
2	Businesses	Impacted business	BE1-GR	High	Informed	
3	Businesses	WW generators	BD1-GR	High	Informed	
4	Capital	Private Investors	CD1-GR	Medium	Informed	
5	Capital	Private Investors	CD2-GR	High	Become part	
6	Capital	Civil Society	CSB1-GR	High	Informed	
7	Capital	Water Utility	CA1-GR	High	Informed	Networking
8	Capital	Water Utility	CA2-GR	High	Informed	
9	Capital	Water Utility	CA3-GR	High	Informed	
10	Capital	Water Utility	CA4-GR	Low	Informed	
11	Capital	ΕΥΔΑΠ Α.Ε.		High	Become part	
12	Civil Society	Citizens	CSA1-GR	Medium	Informed	

13	Knowledge	Professional experts, associations, consulting companies	KC1-GR	Medium	Informed	
14	Knowledge	University	KA1-GR	High	Become part	

Figure 62 : 1st Survey results in the Turkey demo-site for level of interest (Figure 17) and Influence interest matrix (Figure 18) comparisons.

No.	TG	HLS	Stakeholder ID	Interest level (Avg.)	Anticipated level of engagement RHE-MEDiation	
					Within the project	with similar initiatives
1	Administration	Policy Makers	AB10-TR	High	To be networked	
2	Administration	Policy Makers	AB11-TR	High	to be empowered	to be networked
3	Administration	Policy Makers	AB1-TR	High	to be informed	
4	Administration	Policy Makers	AB2-TR	Medium	to be informed	to be networked
5	Administration	Policy Makers	AB3-TR	High	To be networked	
6	Administration	Policy Makers	AB4-TR	Medium	To be networked	
7	Administration	Policy Makers	AB5-TR	High	to be informed	to be networked
8	Administration	Policy Makers	AB6-TR	Medium	to be part of	to be networked
9	Administration	Policy Makers	AB7-TR	High	To be informed	

10	Administration	Policy Makers	AB8-TR	Medium	To be informed	
11	Administration	Policy Makers	AB9-TR	High	to be informed	to be networked
12	Businesses	Businesses that generate wastewater; Businesses that use effluent	BB1-TR	Medium	to be informed	to be networked
13	Capital	water utilities	CA1-TR	Medium	to be part of	to be networked
14	Capital	water utilities	CA2-TR	High	to be informed	to be networked
15	Capital	Wastewater treatment plant owners	CB1-TR	Medium	to be informed	to be networked
16	Capital	Wastewater treatment plant owners	CB2-TR	High	to be part of	
17	Capital	Wastewater treatment plant owners	CB3-TR	Medium	to be part of	to be networked
18	Capital	Wastewater treatment plant owners	CB4-TR	High	to be part of	
19	Capital	Wastewater treatment plant owners	CB5-TR	High	To be informed	
20	Capital	public investor	CD10-TR	High	to be networked	
21	Capital	public investor	CD11-TR	Medium	to be part of	to be networked
22	Capital	public investor	CD12-TR	low	to be informed	to be networked

23	Capital	public investor	CD13-TR	Medium	to be part of	to be networked
24	Capital	private company	CD1-TR	Medium	to be part of	
25	Capital	private investor	CD2-TR	Medium	to be informed	to be networked
26	Capital	private investor	CD3-TR	High	To be informed	
27	Capital	private investor	CD4-TR	High	to be part of	to be networked
28	Capital	private investor	CD5-TR	Medium	to be part of	
29	Capital	private investor	CD6-TR	Medium	to be informed	to be networked
30	Capital	private investor	CD7-TR	High	to be part of	to be networked
31	Capital	private investor	CD8-TR	High	to be part of	
32	Capital	public investor	CD9-TR	Medium	to be informed	to be networked
33	Civil Society	Local citizens	CSA1-TR	High	to be part of	
34	Civil Society	NGO's	CSB1-TR	Medium	To be informed	to be networked
35	Knowledge	Universities	KA1-TR	High	To be part of	
36	Knowledge	Universities	KA2-TR	Medium	To be informed	
37	Knowledge	Universities	KA3-TR	High	to be part of	to be networked
38	Knowledge	Universities	KA4-TR	High	to be part of	
39	Knowledge	Universities	KA5-TR	High	to be informed	to be networked
40	Knowledge	Universities	KA6-TR	High	to be part of	

41	Knowledge	Universities	KA7-TR	High	to be part of	
42	Knowledge	Universities	KA8-TR	High	to be informed	To be networked
43	Knowledge	Research and development centres including national and local laboratories	KB1-TR	High	to be part of	to be networked
44	Knowledge	Associations	KC1-TR	High	to be part of	to be networked
45	Knowledge	Associations	KC2-TR	Medium	To be informed	

ANNEX B

STAKEHOLDERS INVITATION

Invitation to join the Stakeholder's Reference Group for the Horizon Europe project titled: ***Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution*** *(RHE-MEDiation, Grant agreement number: 101113045)*

Challenge

Restoring and protecting the Mediterranean and its waters from chemical pollution is one of the most urgent challenges of our time. Today, the entire water cycle, from 'source to sea,' is under unprecedented pressure due to decades of pollution and unsustainable use, resulting in severe degradation of marine ecosystems.

The EU mission to "Restore our Ocean and Water by 2030" in its quest to protect and restore aquatic ecosystems, prevent and eliminate pollution, and make the blue economy climate - neutral and circular through research and innovation, citizen engagement and blue investment has setup four area-based "Lighthouses" that act as hubs to develop, demonstrate and deploy new solutions, far and wide, and guide us in our journey to restoring our oceans and waters. In particular the "Mediterranean Lighthouses", works towards a healthy and pollution free Mediterranean Sea.

RHE-MEDiation falls under the "Mediterranean Lighthouses," with a focus on regional engagement and cooperation for supporting the work of policymakers by providing low energy and high circularity remediation solutions for a range of chemically polluted Mediterranean confined waters (HOT SPOTs) based on tailored micro algae, along with modalities and tools for substances monitoring and control, and by proposing citizens empowerment in the cleaning process and culture.

For this purpose, RHE-MEDiation sets itself three strategic goals:

- Prevent chemical pollution in waters from reaching the Mediterranean Sea and address environmental challenges with innovative solutions along the entire discharge networks.
- Minimize and control by enabling prompt reactions in the Mediterranean HOT SPOTs, promoting data sharing with stakeholders at demo-sites.
- Eliminate and remediate existing polluted HOT SPOTs by working at the source of major pollution to enable a return to a 'good environmental status' in the long term through improved dilution conditions.

Approach

The RHE-MEDiation project will deploy chemical pollution remediation technologies that will be integrated within existing water/wastewater treatment systems and complemented with mobile and fixed sensing systems to identify and measure the presence of chemical substances in both land and marine waters, being measured data delivered to the EC EMODnet platform to contribute to the Digital Twin of the Ocean. The chance for the proposed solutions to be

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diffusely employed to contribute to cleaning waters from chemical pollutants before they reach the sea is associated to the demonstrated efficiency of an integrated framework that facilitates upscaling, starting from validation and demonstration at local demo-sites and extending to assessment and appraisal from local to national levels, and further on to EU level.

Embracing an interdisciplinary approach, the project strives to advance the destress capability against chemical pollution in the Mediterranean Sea across three countries (Italy, Greece and Turkey), with a strategic vision to expand its impact to encompass five additional countries of the Mediterranean basin.

Demonstration sites

The Italian demo-site is located in the "Mar Piccolo," which is a coastal basin north of Taranto. Specifically, the 1st inlet of Mar Piccolo, the site of the SGM srl shipyard will act as a base for capturing and treating waters from the Citrello canal that flow into the inlet.

In Greece, the selected demo-site is represented by the Thriasio Wastewater Treatment Plant. West of Athens, it serves the Municipalities of Aspropyrgos, Elefsina, and Mandra-Idyllia, also receiving pre-treated liquid waste from nearby industries and businesses.

The Dilovası Municipal Wastewater Treatment Plant serves as the demo-site in Turkey. It is located in the east/northeast of the Marmara Region and plant treats domestic wastewater and wastewater originating from industries.

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Who could become member of the Stakeholders Reference Group?

- Those entities, including citizens, who are directly impacted by the change of water quality in the demonstration sites.
- Businesses and industries that are interested in the reuse of high-quality effluent for different purposes.
- Organizations that advocate education, research and Innovation as applied to Water quality, Wastewater plants, the Environment and Health in the broad and specific terms, etc.
- SME and professionals that could be directly involved in supply and construction related to the demonstration sites.
- Authorities in the Municipality where the project is planned to be deployed.
- Governmental and non-governmental organizations that advocate for the environment and water quality.
- Industries that may adopt the remediation technology for treating effluent in their premises.

What is the Scope of the Stakeholders Reference Group?

Be informed about the recovery action that is proposed by the RHE-MEDiation project for validation and demonstration purposes at the demo-sites and receive successive information about the efficiency and the impacts of these changes in water quality.

Be part of the co-design activity that will decide the prioritisation in the remediation actions to be set up and of the monitoring activity, once the system is fully operative.

Be empowered because of the developed knowledge on water conditions and potential remediation actions efficiency to influence decision makers to invest in projects that improve water quality, in the context of environmental policies to reduce anthropogenic pollution in contaminated areas of the country.

Be networked with other stakeholders-based ecosystems that are running similar initiatives in Europe and outside Europe to share knowledge and expectations and envision a common feeling on water and water quality preservation for the future.

What is the action planning?

Primarily, three workshops will be conducted at each demo-site with the attendee of stakeholders. The 1st workshop will introduce the project, involve stakeholders in co-design activities to establish social empowerment and share accountability among stakeholders regarding the remediation needs, governance, and evolution of the demo-site. The 2nd and 3rd workshops will take place before and after the piloting activities, aiming to inform and engage stakeholders about the planned activities and the results obtained, respectively.

Secondly, depending on the project's needs and stakeholders' interests, various engagement activities will be organized, and official invitations will be sent to stakeholders to join.

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Specifically, for stakeholders joining the project at the level of "Citizen" and living close to a demo-site, continuous empowerment activities will be organized to create local champions capable of influencing future quality of water bodies in their surroundings.

Each engagement/empowerment activity will be documented in a report, to which all stakeholders will have access to, allowing them to assess the results of their involvement.

Conclusions

RHE-MEDIATION aims to establish effective water pollution management by efficiently controlling individual pollutants, including the most challenging, and helping to set up appropriate propositions to regulatory framework. Stakeholders from different sectors will engage in activities designed on project need and stakeholders' own interest. Moreover, stakeholders at the level of "Citizen" and residing close to a demo-site, will be empowered to become "Citizen scientists" capable of advocating for evidence-based policies and actions regarding future quality of water bodies in their surroundings and in particular the HOT SPOTs, thereby exerting influence on decision-makers for a healthy and pollution free Mediterranean Sea.

Thank you for your cooperation and interest to the initiative.

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ANNEX C

SAVE THE DATE

RHE-MEDiation

The RHE-MEDiation Stakeholder Workshop

11 Ottobre 2023
Aula Magna
Sede UniBA di Paolo VI,
Via De Gasperi, Taranto

Vi invitiamo a partecipare al workshop che si svolge nell'ambito del Programma di Ricerca Europeo HORIZON2020, RHE-MEDiation: Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution al quale partecipano 11 partner, tra cui IRSA - CNR e IAS - CNR.

RHE-MEDiation è un progetto "faro" nel Mediterraneo della durata di tre anni (2023-2026) che mira a fornire una tecnologia di bonifica dell'inquinamento chimico a basso consumo energetico e ad alta circolarità, basata sull'utilizzo di microalghe, da integrare nei sistemi di trattamento delle acque e delle acque reflue esistenti e da integrare con sistemi di rilevamento mobili e fissi per identificare e misurare la presenza di sostanze chimiche sia nelle acque terrestri che in quelle marine; i dati misurati saranno consegnati alla piattaforma EMODnet della CE per contribuire al gemello digitale dell'oceano.

Con un approccio interdisciplinare, il progetto si propone di far progredire la capacità di abbattimento di inquinamento chimico in HOT SPOT identificati (ovvero corpi idrici inquinati) nel Mar Mediterraneo in tre Paesi (Italia, Grecia e Turchia), con la visione strategica di espandere il suo impatto fino a comprendere altri cinque Paesi del bacino del Mediterraneo.

Il workshop si propone di:

- Offrire alle parti interessate una panoramica completa del progetto e dei suoi siti dimostrativi
- Stabilire l'empowerment sociale e la responsabilità condivisa tra le parti interessate per quanto riguarda le esigenze di bonifica, la governance e l'evoluzione del sito dimostrativo
- Facilitare il coinvolgimento delle parti interessate nelle tavole rotonde
- Rispondere alle richieste di informazioni relative al progetto da parte delle parti interessate e raccogliere i loro contributi
- Riconoscere il ruolo delle parti interessate nel progetto

In collaborazione con UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO Corso di laurea triennale in scienze ambientali

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A CHI SI RIVOLGE

Il progetto RHE-MEDiation, “Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution”, finanziato dal programma Horizon Europe con il Grant Agreement Number 101113045, ha come uno dei siti di prima applicazione della tecnologia aree prospicienti il Mar Piccolo di Taranto e mira a coinvolgere coloro che si occupano di trattamento delle acque e delle acque reflue, investitori, sviluppatori di opportunità finanziarie, imprese che producono acque reflue, imprese che hanno un impatto sugli HOTSPOT, autorità governative, responsabili politici, cittadini, organizzazioni non governative, Università e Politecnici, istituti di ricerca, centri di ricerca e sviluppo, laboratori nazionali e locali, professionisti, associazioni, società di consulenza e tutte le organizzazioni interessate alle tecnologie di bonifica su base naturale per il miglioramento della qualità delle acque.

AGENDA

09.00 - 09.30	Registrazione
09.30 - 10.15	Saluti Coordinatore di Scienze Ambientali, dell’Università degli Studi di Bari, Rappresentante del Comune di Taranto Coordinatore del progetto RHE-MEDiation, RINA-C Rappresentante CNR del progetto RHE-MEDiation
10.15 - 11.00	Quando i sedimenti di dragaggio incontrano i gusci dei mitili: una storia di ingegneria geotecnica Politecnico di Bari
11.00 - 11.30	Siti dimostrativi del progetto: Sito dimostrativo Greco -Thriasio WWTP Sito dimostrativo Turco -Dilovası Sito dimostrativo italiano, Mar Piccolo: sfide e metodologia, monitoraggio dei dati dei contaminanti chimici e tecnologia RHE-MEDiation
11.30 - 11.45	Strategia di Networking per RHE-MEDiation CNR
11.45 - 12.45	Tavola rotonda con gli stakeholder
12.45 - 13.00	Sondaggio finale da completare in tempo reale, attestati

SAVE THE DATE

RHE-MEDiation

The RHE-MEDiation Stakeholder Workshop

04 October 2023
EYDAP R&D, Athens (GR)

Σας προσκαλούμε στο Εργαστήριο που διοργανώνουμε την **Τετάρτη 4 Οκτωβρίου 2023**, και ώρες 09:00-15:00 στο Κέντρο Ερευνών και Εφαρμογών Υγειονομικής Τεχνολογίας (ΚΕΡΕΦΥΤ) της ΕΥΔΑΠ, 13,5ο χλμ. Εθν. Οδού Αθηνών - Λαμίας, Μεταμόρφωση Αττικής. Το Εργαστήριο πραγματοποιείται στο πλαίσιο του Ευρωπαϊκού Ερευνητικού Προγράμματος Horizon Europe, **RHE-MEDiation: Responsive hub for long term governance to distress the Mediterranean Sea from chemical pollution** στο οποίο συμμετέχουν 11 εταίροι, μεταξύ των οποίων η **ΕΥΔΑΠ Α.Ε.** και το **Ελληνικό Κέντρο Θαλάσσιων Ερευνών**.

Το RHE-Mediation είναι ένα τριετές ευρωπαϊκό έργο (2023-2026) που θα αναπτύξει ένα «φάρο» στην περιοχή της Μεσογείου, με στόχο τη δημιουργία ενός κόμβου ανταπόκρισης για μια μακροπρόθεσμη διακυβέρνηση, ώστε **να μειωθεί η πίεση από τη χημική ρύπανση στη Μεσόγειο Θάλασσα**. Συγκεκριμένα, ουσίες με τη μεγαλύτερη επίδραση, επί του παρόντος, στο θαλάσσιο περιβάλλον της Μεσογείου, οι οποίες απειλούν άμεσα την βιωσιμότητά της αν δεν παρθούν ουσιαστικά μέτρα, όπως τα βαρέα μέταλλα, τα εντομοκτόνα, τα P.F.A.S. και τα «παντοτινά χημικά», θα πρέπει να κατακρατούνται και να αφαιρούνται από το νερό και τα λύματα, πριν εισέλθουν στη θάλασσα.

Οι δράσεις του προγράμματος περιλαμβάνουν την εφαρμογή καινοτόμων και αποδοτικών συστημάτων, τεχνολογιών, και υπηρεσιών παρακολούθησης εκροών Κέντρων Επεξεργασίας Λυμάτων και παράκτιων υδάτων. Οι δράσεις του προγράμματος στην Ελλάδα περιλαμβάνουν την εφαρμογή αυτών των συστημάτων στο ΚΕΛ Θριασίου και στον Κόλπο της Ελευσίνας, ενώ αντίστοιχες δράσεις θα γίνουν και στην Ιταλία και Τουρκία. Απώτερος στόχος είναι η διάδοση των αναμενόμενων πλεονεκτημάτων και δυνατοτήτων του RHE-MEDiation, σε 5 επιπλέον πιλοτικές περιπτώσεις στη Μεσόγειο.

Το Εργαστήριο έχει ως στόχο:

- Να ενημερώσει τους ενδιαφερόμενους φορείς για τους στόχους του Έργου και τις Περιοχές Μελέτης
- Να εδραιώσει τον κοινωνικό αντίκτυπο του έργου και την ανάγκη αποκατάστασης, διακυβέρνησης και βελτίωσης της ποιότητας του θαλάσσιου περιβάλλοντος
- Να ενεργοποιήσει τη συμμετοχή των φορέων μέσω συζητήσεων σε επίπεδο θεματικών ενοτήτων
- Να καταγράψει συγκεκριμένα ερωτήματα και ανάγκες των συμμετεχόντων
- Να αναδείξει τον ρόλο των φορέων για ένα επιτυχημένο RHE-MEDiation

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ΣΕ ΠΟΙΟΥΣ ΑΠΕΥΘΥΝΕΤΑΙ

Σε εκπροσώπους από Δημοτικές Επιχειρήσεις Ύδρευσης και Αποχέτευσης, Κρατικές Αρχές, όπως το Υπουργείο Περιβάλλοντος και Ενέργειας και η Ειδική Γραμματεία Υδάτων, οι Περιφέρειες, οι Δήμοι και οι Δημοτικές αρχές, σε Επιχειρήσεις και Επενδυτικούς Οργανισμούς, Πανεπιστήμια, Ερευνητικά Ινστιτούτα, Κέντρα Έρευνας και Ανάπτυξης, Μη Κυβερνητικές Οργανώσεις και όλους τους πολίτες που ενδιαφέρονται για τις τεχνολογίες αποκατάστασης με βάση το φυσικό περιβάλλον για τη βελτίωση της ποιότητας του νερού.
Σας περιμένουμε στις εγκαταστάσεις του Κέντρου Ερευνητικών Εφαρμογών Υγειονομικής Τεχνολογίας (ΚΕΡΕΦΥΤ) της ΕΥΔΑΠ, στη Μεταμόρφωση, για μια ενδιαφέρουσα συζήτηση με απώτερο στόχο την ορθότερη διαχείριση των υδατικών πόρων.

ΠΡΟΓΡΑΜΜΑ ΕΡΓΑΣΤΗΡΙΟΥ

09.00 - 09.30	**Προσέλευση Εγγραφές - Καφές**
09.30 - 10.30	Έναρξη, Χαιρετισμοί, Στόχοι Εργαστηρίου
10.30 - 10.40	Welcome and introduction to RHE-MEDiation project (EN)
10.40 - 10.50	The Italian demo-site “Mar Piccolo” (EN)
10.50 - 11.00	The Turkish demo-site “Dilovası” (EN)
11.00 - 11.10	Η Ελληνική Περιοχή Μελέτης «ΚΕΛ Θριασίου»: Προκλήσεις και μεθοδολογία (GR)
11.10 - 11.30	Κόλπος της Ελευσίνας: πιλοτική εγκατάσταση και παρακολούθηση δεδομένων χημικών ρύπων & τεχνολογία RHE-Mediation (GR)
11.30 - 12.00	**Διάλειμμα Καφέ**
12.00 - 12.10	Νέα Ευρωπαϊκή Οδηγία για την Επαναχρησιμοποίηση Νερού (GR)
12.10 - 12.20	Στρατηγική Διάχυσης και Επικοινωνίας για το RHE-MEDiation (GR)
12.20 - 13.30	Συζήτηση με Στοχευμένες Θεματικές Ενότητες για μικρές ομάδες (Στρογγυλά Τραπέζια/15’ λεπτών)
13.30 - 13.45	**Διεξαγωγή Τελικής Έρευνας**
13.45 - 14.30	**Ελαφρύ Γεύμα**
14.30 - 15.00	Σύνοψη Ημερίδας, παρεμβάσεις ενδιαφερόμενων φορέων και Συμπεράσματα Τελικής Έρευνας
15.00	**Απονομή Πιστοποιητικού Συμμετοχής & Πέρας της Ημερίδας RHE-MEDiation**

***με smart phone ή laptop για την διεξαγωγή σε πραγματικό χρόνο της τελικής έρευνας**

SAVE THE DATE

RHE-MEDiation

RHE-MEDiation Paydaş Çalıştayı

02.Ekim.2023
TÜBİTAK Gebze Kampüsü, Kimya Esnek Pilot Tesis Konferans Salonu

RHE-MEDiation Projesi tarafından, yerel paydaşlarla işbirliğine dayalı katılımı teşvik etmek amacıyla düzenlenen Paydaş Çalıştay'a katılımınız için sizleri davet etmek istiyoruz.

RHE-MEDiation, mevcut su/atıksu arıtma sistemlerine entegre edilecek mikroalg bazlı düşük enerji ve yüksek verimlilik ile kimyasal kirlilik giderme teknolojisi sağlamayı amaçlamaktadır. Sistem, aynı zamanda hem tuzlu hem tatlı suda kimyasal maddelerin varlığını belirlemek ve ölçmek için mobil ve sabit ölçüm sistemleriyle desteklenecektir. Projemiz bir "Akdeniz Deniz Feneri (Akdeniz Light House)" projesidir (2023-2026). İzleme verilerimiz, Dijital İkiz Okyanus (Digital Twin of Ocean)'a katkıda bulunmak amacıyla Avrupa Komisyonu tarafından oluşturulmuş olan EMODnet platformuna iletilecektir.

Projemiz, üç ülkede (İtalya, Yunanistan ve Türkiye) Akdeniz'de belirlenen SICAK NOKTALAR'da (yani kirli su kütlelerinde) kimyasal kirliliği önleme kapasitesini geliştirmeyi amaçlamaktadır. Aynı zamanda etkisini Akdeniz'de yer alan beş farklı ülkeyi de kapsayacak şekilde genişletmeye yönelik stratejik bir vizyona sahiptir.

ÇALIŞTAY AMAÇLARI

- Paydaşlarımıza proje ve uygulama alanları hakkında genel bir bakış açısı sunmak
- Paydaşlarımız arasında uygulama alanımızın iyileştirme ihtiyaçları, yönetimi ve gelişimi ile ilgili olarak sosyal bilinci oluşturmak
- Paydaşlarımızın projeyle ilgili sorularını yanıtlamak ve onların görüşlerini almak
- Paydaşlarımızın yuvarlak masa etrafında konuyu tartışmalarına fırsat vermek
- Paydaşlarımızın projemizde alabilecekleri rolleri tanımlamak

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PAYDAŞLARIMIZ

Su ve Kanalizasyon İdareleri, Atıksu Arıtma Tesisi İşletmecileri, Kamu Yatırımcıları, Özel Yatırımcılar, Finansal Kurumlar, Arıtılmış Atıksu Kullanan İşletmeler, Atıksu Üreten İşletmeler, "SICAK NOKTA" da Konumlanması Sebebiyle Kirlilikten Etkilenen İşletmeler, Kamu Kurumları, Bakanlıklar, Halk, Sivil Toplum Kuruluşları, Üniversiteler, Araştırma ve Geliştirme Merkezleri (Ulusal ve Yerel Laboratuvarlar Dahil), Profesyonel Uzmanlar, Birlikler ve Danışmanlık Şirketleri, Su Kalitesinin Geliştirilmesinde Doğal Temelli Çözümlerin Kullanılması ile İlgilenen Tüm Kurumlar

ÇALIŞTAY PROGRAMI

09.30 - 10.00	Kayıt
10.00 - 10.10	Açılış Konuşması- Proje Koordinatörü
10.10 - 10.15	Açılış Konuşması- TUBITAK MAM
10.15 - 10.30	Proje Hakkında Genel Bilgilendirme
10.30 - 11.00	Proje Uygulama Alanları Yunanistan-Uygulama Alanı- Thriasio AAT İtalya- Uygulama Alanı- Picolo Körfezi Türkiye-Uygulama Alanı- Dilovası AAT
11.00 - 11.20	İzmit Körfezi Mevcut Kirlilik Durumu
11.20 - 11.35	RHE-MEDiation Teknolojileri Alg biyoreaktörleri ve online sensor izlemesi
11.35 - 11.50	**Kahve arası**
11.50 - 12.10	Projenin Paydaş Yönetim ve Katılım Stratejisi
12.10 - 13.00	Soru-Cevap-Görüşler
13.00 - 14.00	**Öğle Yemeği**
14.00 - 15.00	Yuvarlak Masa Tartışmaları
15.00 - 15.15	**Kahve arası**
15.15 - 15.45	Yuvarlak Masa Tartışmaları Sonuçları Hakkında Gurup Sunumları
15.45 - 16.00	2.Anket Çalışması (Online)
16.00 - 16.30	Genel Değerlendirme-Sertifikaların Sunulması-Kapanış

ANNEX D

Stakeholders Workshop
Italy Reference Group
Oct 11, 2023 - Taranto

Name
Surname

PARTICIPANT

Funded by the European Union

Stakeholders Workshop
Greece Reference Group
Oct 04, 2023 - Athens

Name
Surname

PARTICIPANT

Funded by the European Union

Stakeholders Workshop

Turkey Reference Group
Oct 02, 2023 - Gebze

Name
Surname

PARTICIPANT

Funded by the European Union

CERTIFICATE OF PARTICIPATION

This is to certify that

Xxxxx Xxxxx

has participated in the workshop

Development of collaborative actions with local stakeholders to design the demo-site evolution

This certificate is issued by

EYDAP SA and HCMR

in

Greece on October 04, 2023.

EYDAP SA

HCMR

Funded by the European Union

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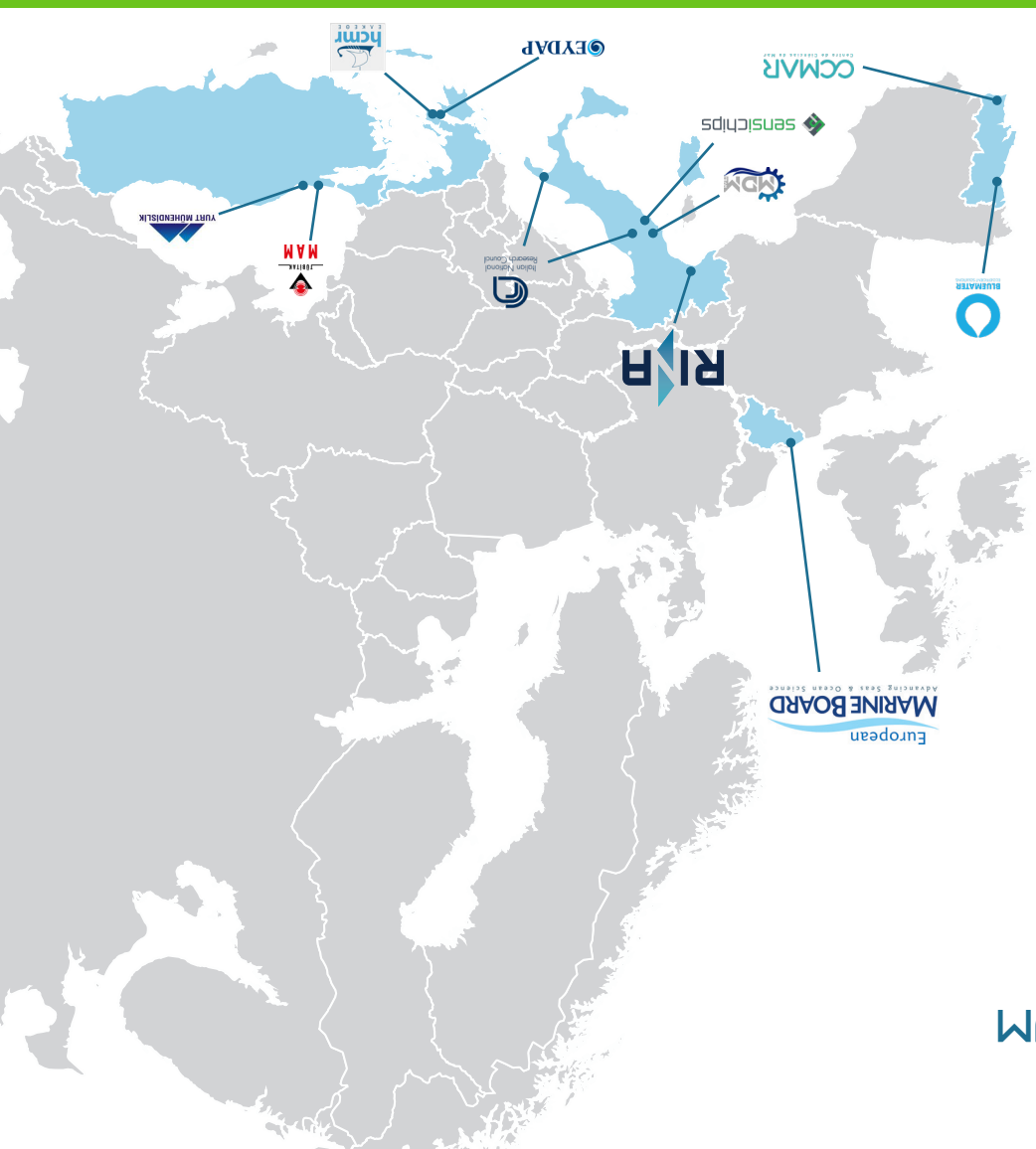
PROJECT RESULTS

Development of Adaptive and easily reproducible microalgae based plants for reducing heavy metals, PFAS, pharmaceuticals, and pesticides in polluted waters	Development of smart integrated measurement points for monitoring real chemical pollution cases	Integrate replicable microalgae-based technologies to existing wastewater treatment plants	Integration with Ocean and Water digital twins
Evolutionary holistic model to combine technology, business, social acceptability and accountability, and innovative governance based on regulatory paradigm	Unregulated chemicals characterisation protocols for replication purposes	Input to Water Framework Directive and Marine Strategy Framework Directive based on experience on real scenarios and contaminants	Tailored citizens empowerment models upscaled from local to national and EU level
Contribution to shared processes among Lighthouses as well as Blue Park Initiatives	Links with EC Mission Implementation Support Platform	RHE-MEDiation replication process	Communicate and disseminate the RHE-MEDiation achievements in open and transparent ways



THE CONSORTIUM

RHE-MEDiation

Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

Funded by the European Union

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EU MISSIONS RESTORE OUR OCEAN & WATERS

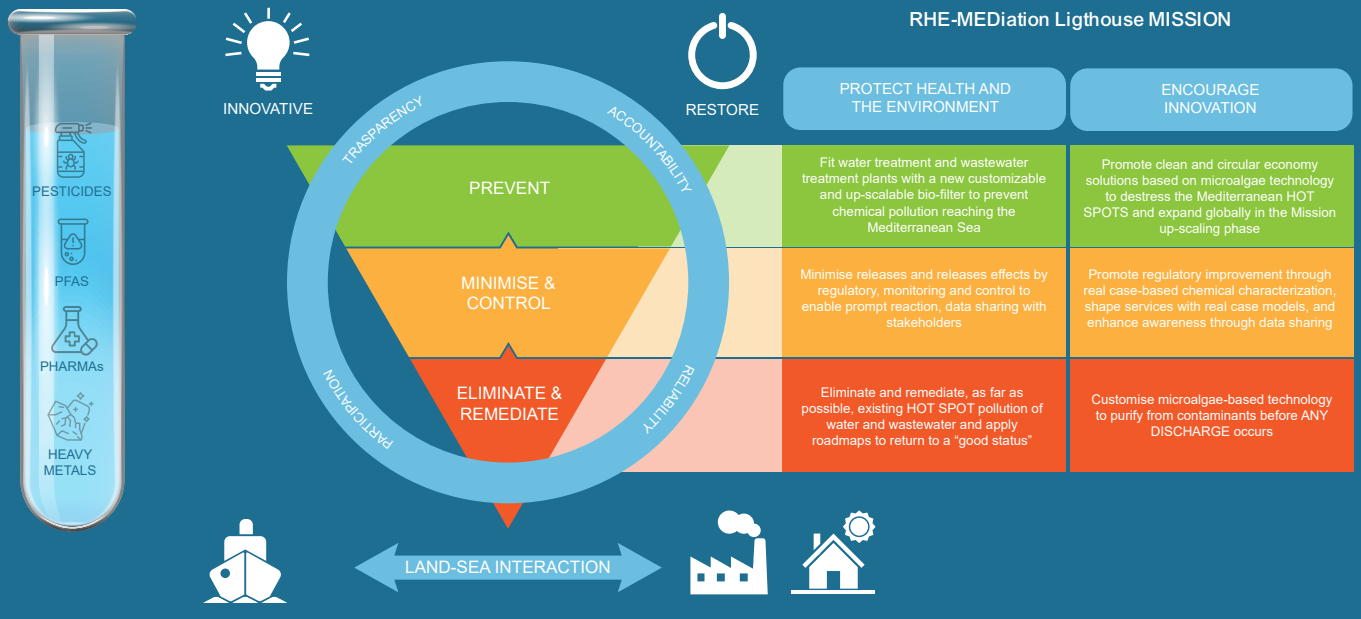
THE CONCEPT

RHE-MEDiation aims at establishing a responsive hub deploying long-term governance centred on the mission to **destress the Mediterranean Sea from chemical pollution**, including peak concentrations in known HOT SPOTs.
In particular, the project intends to **stop and remove the most impacting components** that currently affect Mediterranean resources from the fresh and waste waters before they enter the sea.

11 partners | 36 months | 5 countries | 5 794 495.38

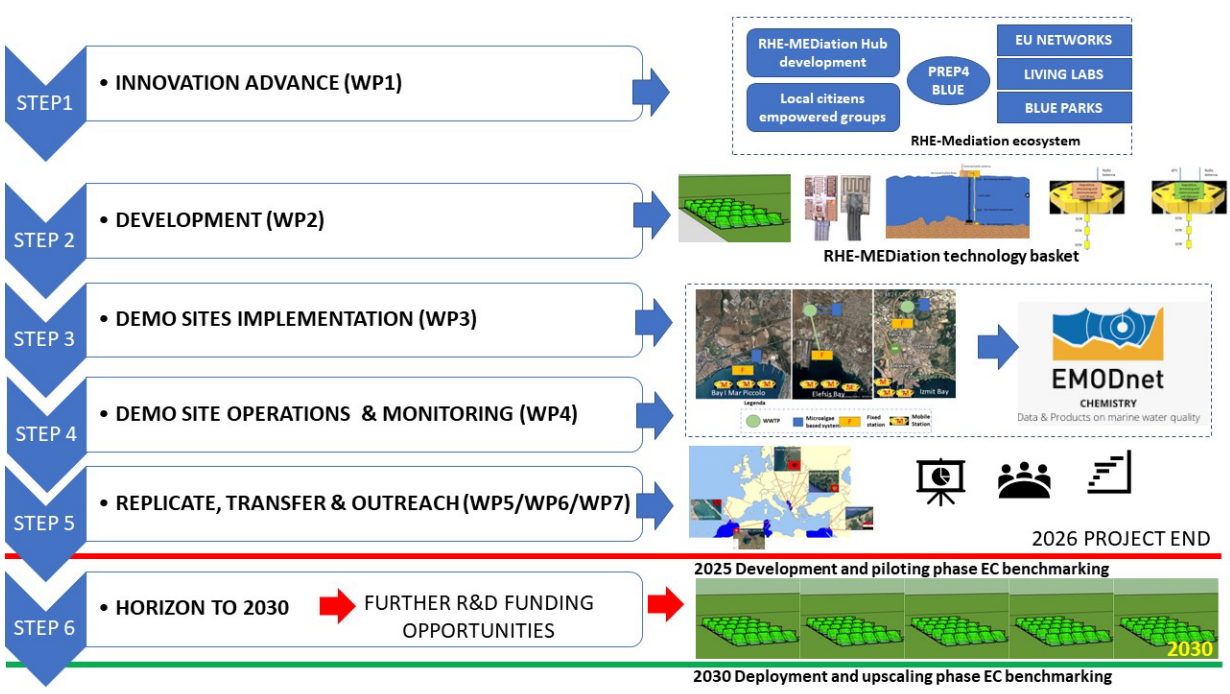
THE MISSION

RHE-MEDiation will support the work of policymakers by providing **advanced remediation solutions for the Mediterranean HOT SPOTs, and modalities and tools for monitoring and control**, enabling parallel citizen empowerment in this action.



METHODOLOGY

The project follows a 5-step methodology in order to ensure the successful project delivery and TRL achievement. The sixth step highlights the potential funding opportunities towards the 2030 benchmarking.



Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

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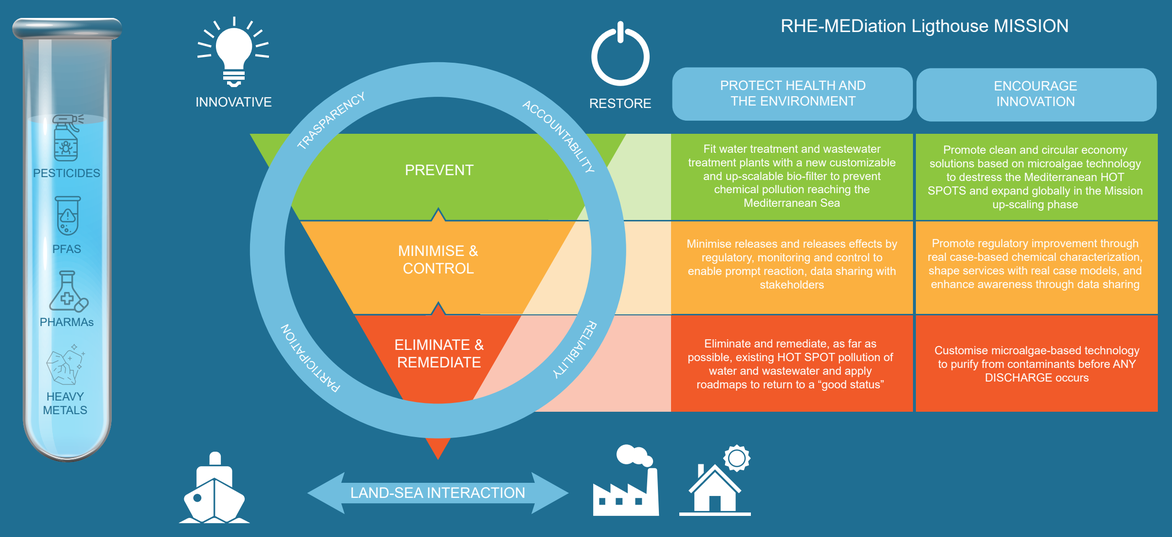

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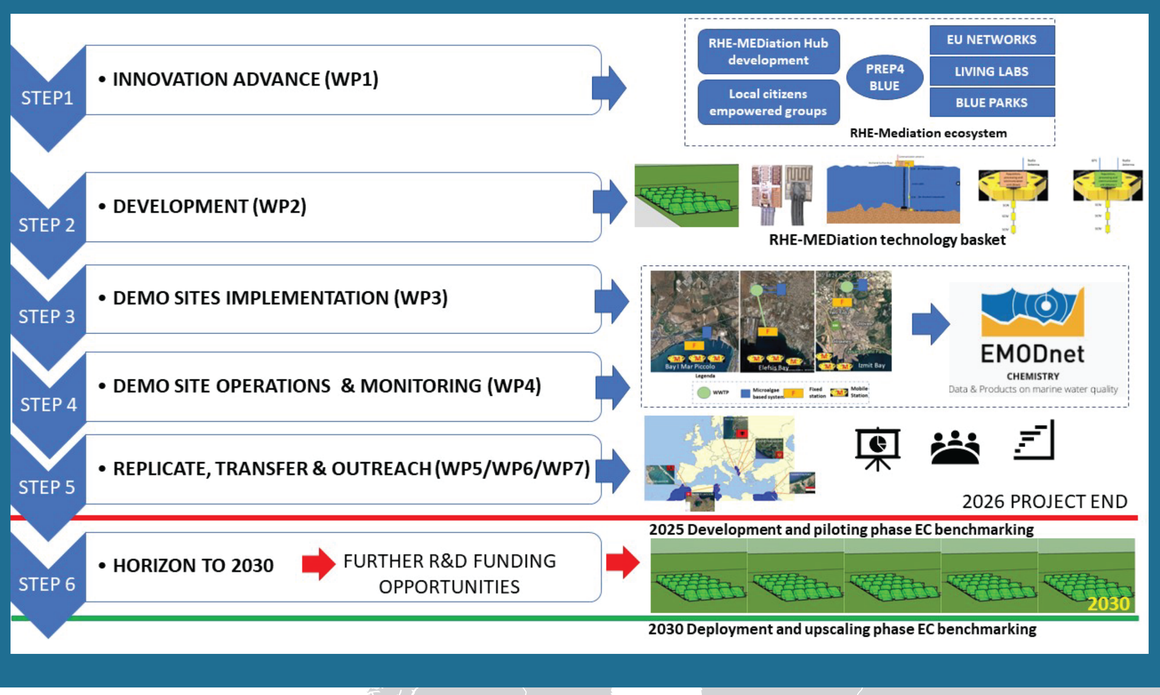

PROJECT RESULTS

Development of Adaptive and easily reproducible microalgae based plants for reducing heavy metals, PFAS, pharmaceuticals, and pesticides in polluted waters	Development of smart integrated measurement points for monitoring real chemical pollution cases	Integrate replicable microalgae-based technologies to existing wastewater treatment plants	Integration with Ocean and Water digital twins
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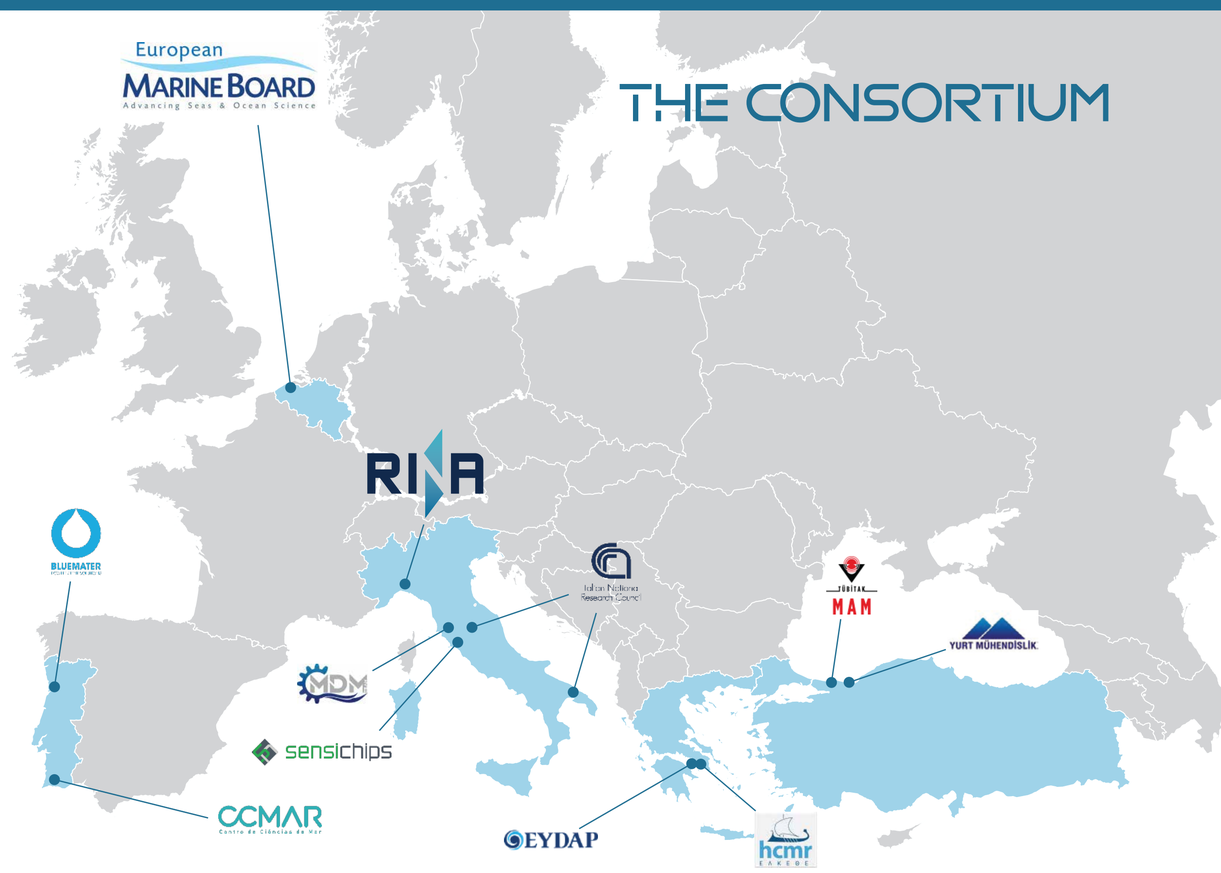
THE CONSORTIUM



Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

The Microalgae based Photobioreactor

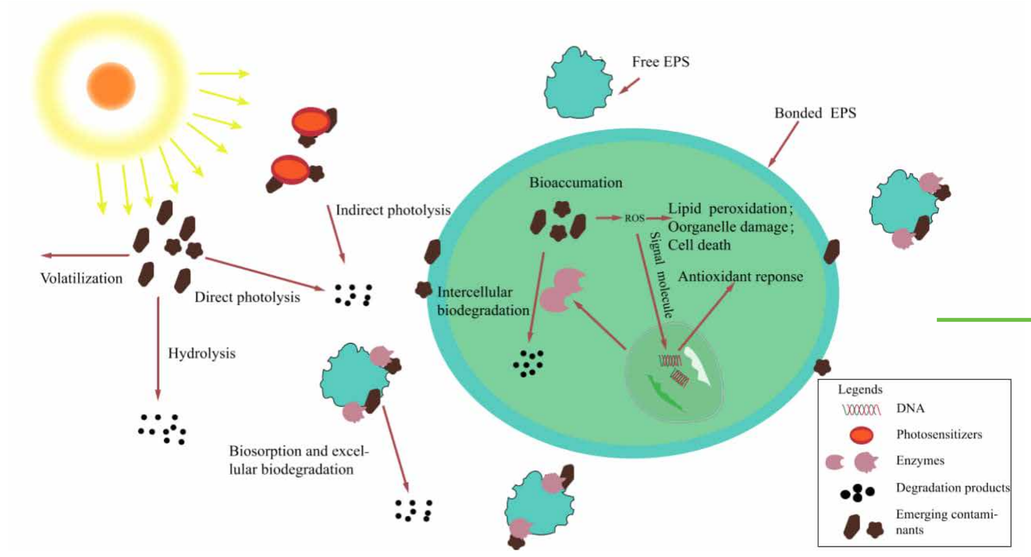
Microalgae are photosynthetic microorganisms able to grow with nutrients present in wastewater. Additionally, they can accumulate toxic metals and persistent organic pollutants (e.g., pharmaceuticals, pesticides, etc.) removing them from the wastewater and decreasing the pollution of the receiving water bodies. The produced microalgal biomass, depending on its degree of contamination by the removed pollutants, can still be upgraded to produce biofuels, biofertilizers or to extract added-value compounds.

The microalgae based photobioreactor proposed in the RHE-MEDiation project, GREEN DUNE® (international patent pending), is designed and supplied by Bluemater. It is a highly efficient biological remediation technology when integrated into water and wastewater treatment plant (WWTP) systems, capable of removing excess nutrients and priority pollutants. It has low installation and operating costs.

Its prismatic shape is designed to optimize the treated volume in smaller spaces and maximize sun exposure.

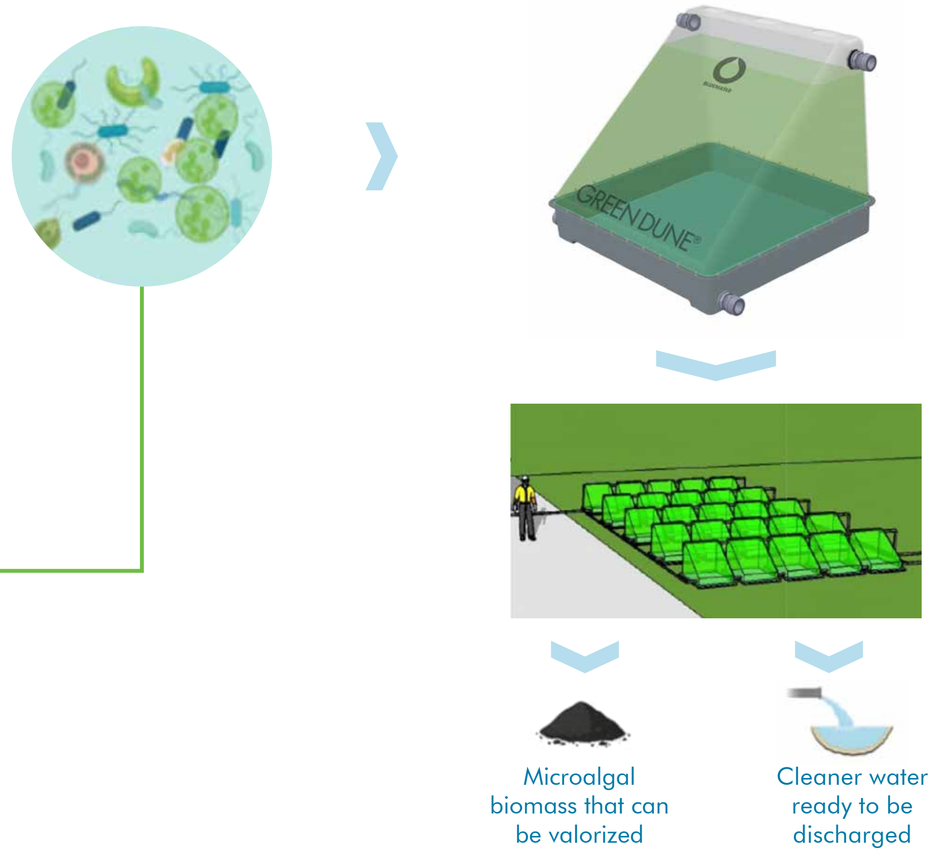
Depending on the species, microalgae are able to detoxify their environment by a process called Bioremediation.

Bioremediation is a process of contaminants removal from water using microorganisms. The contaminants can be ccumulated or degraded using the microorganisms metabolic capability to break down a wide range of pollutants.



Source: Zhou, Jin-Long, et al. "Mechanisms and application of microalgae on removing emerging contaminants from waste-water: A review." Bioresource Technology (2022): 128049. 1

Inside the GREEN DUNE photobioreactors, a natural consortia of microorganisms will form and grow differently depending on the season climate conditions and water composition.

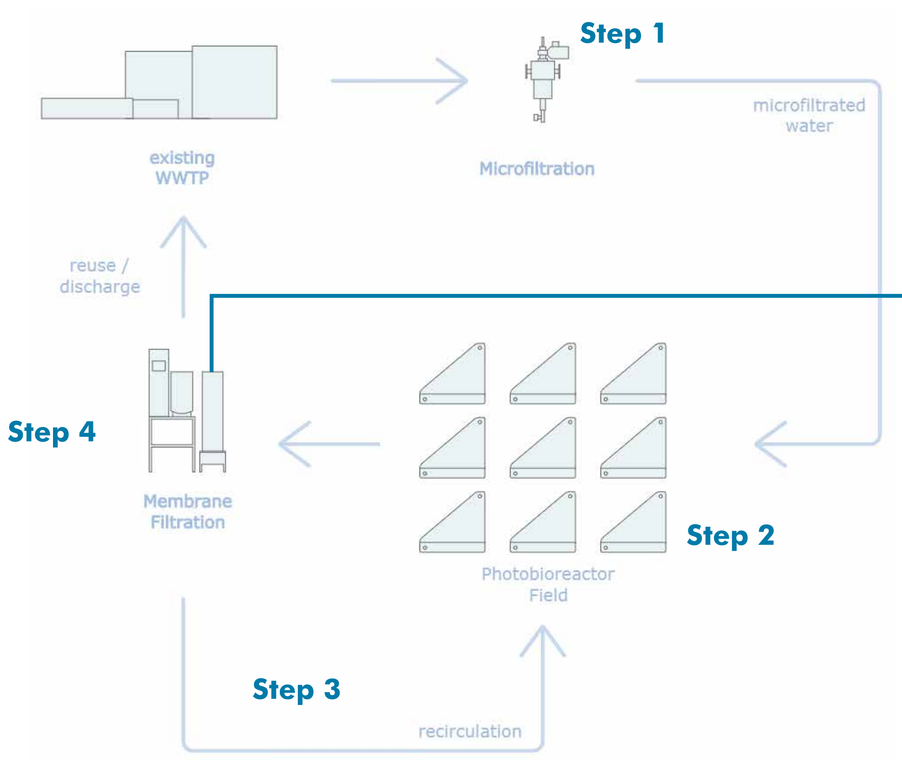


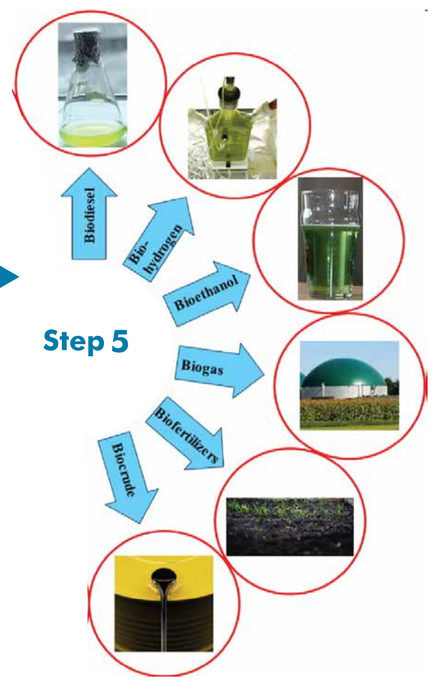
Microalgal biomass that can be valorized

Cleaner water ready to be discharged

The water entering the Microalgae based Photobioreactor will go through the following steps:

Step 1 - Microfiltration - Water coming from the secondary treatment tanks will be microfiltrated.
Step 2 - Microalgae treatment - The microfiltrated water will pass through the photobioreactors, where natural microalgal blooms will remove excess nutrients and pollutants.
Step 3 - Recirculation - Water coming from the photo-bioreactors will be filtrated by a membrane system and part will return to the photobioreactors.
Step 4 - Reuse / discharge - Part of the recirculated water is discharged or reused for washing and irrigation.
Step 5 - Biomass reuse - The microalgal biomass produced in the photobioreactors will be reused and upgraded.





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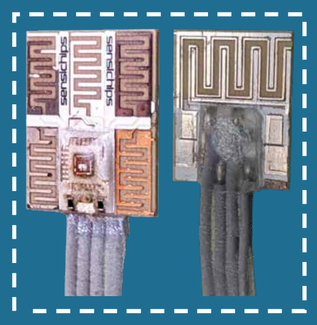
EU MISSIONS RESTORE OUR OCEAN & WATERS

Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

Supplementary Technologies in the RHE-MEDiation Technology Basket for Validation and Replication

1. Development of smart integrated measurement points for monitoring real chemical pollution cases

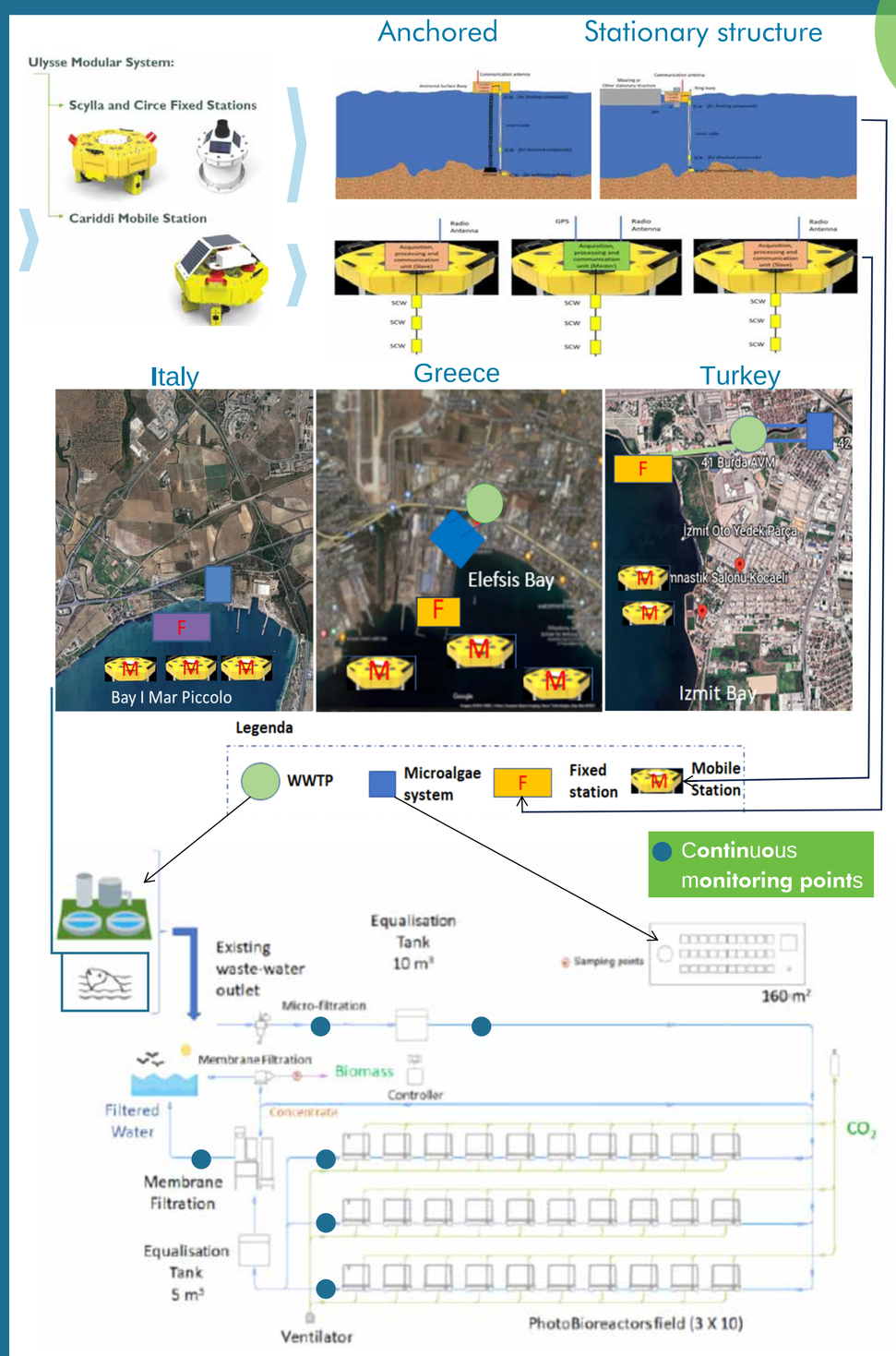


Multi-sensor microsystem (SCW)

Designed and supplied by **SENSICHIPS SRL**, the micro-sensor based technology allows for real-time identification of a wide range of chemical contaminants

Chemical substances monitoring

MDM TEAM SRL design and develops integrated arrays of chemical measurement stations (fixed and mobile) with autonomous and cooperative capabilities

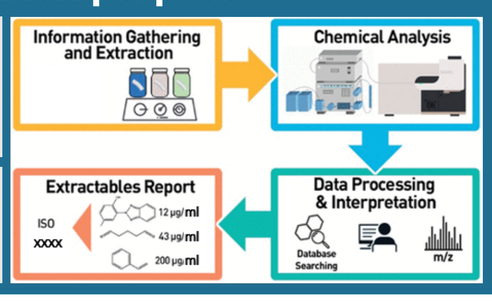


Data collection

2. Unregulated chemicals characterization protocols for replication purposes

Establish the level of accuracy of chemical characterisation protocols based on the discrimination capacity achievable by the measurements ensing technology tested and validated at the demo-sites.

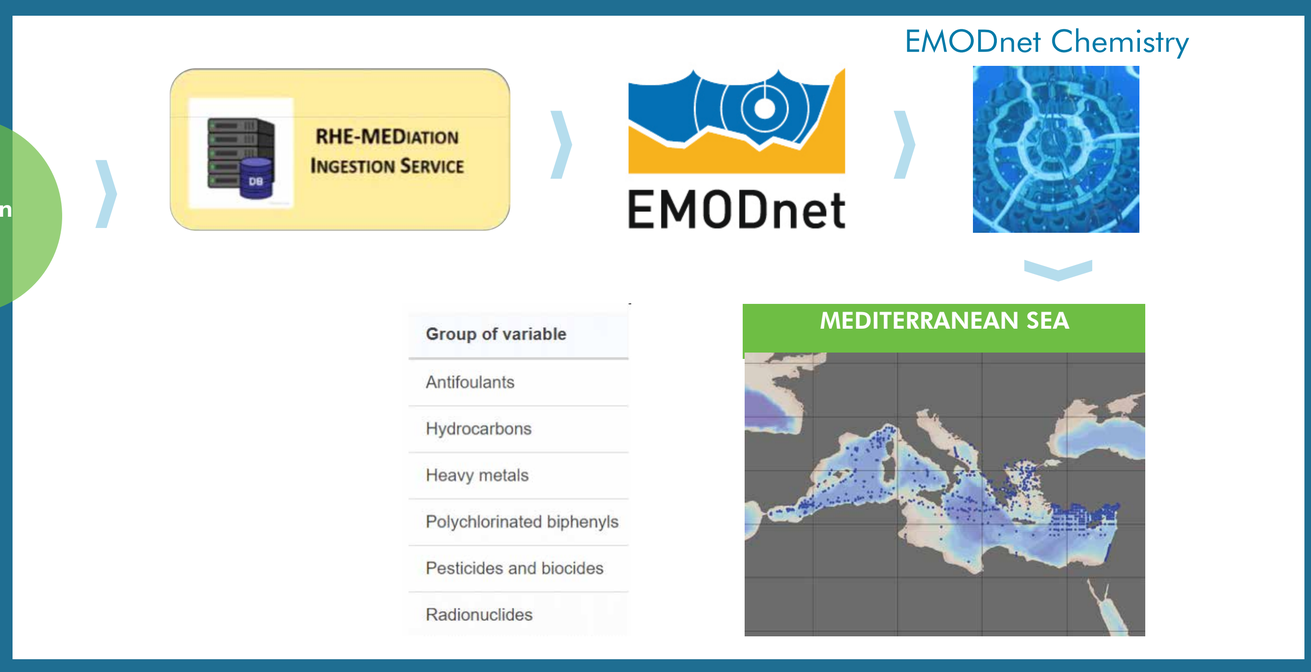
Maximise exploitation of accuracy of chemical characterisation protocols to optimise the design of microalgae-based packages for replication purposes.



3. Data Integration with ocean and water digital twins

The European Marine Observation and Data Network (EMODnet)

EMODnet is a network of organisations supported by the EU's integrated maritime policy to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products.These are all relevant for the implementation of EU marine policies such as MSFD, WFD, and Maritime Spatial Planning Directive (MSPD).
Feeding data to **EMODnet Chemistry** is the focus of this project.

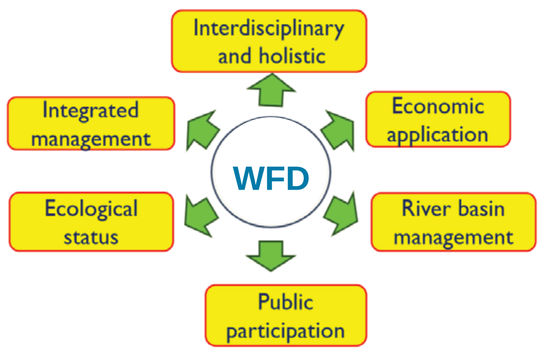


4. Input to Water Framework Directive and Marine Strategy Framework Directive

Water Framework Directive (WFD)

The key objectives of the WFD is supporting inland, transitional and coastal surface waters as well as groundwaters of Europe reach Good Status Conditions with both their chemical and ecological parameters adhering to the following key approaches:

- Appreciation of all aspects of water management and the need for multi-sectorial integration
- Structure and functioning of ecosystems
- Promoting decentralized policy making



- Understanding complexity and system interactions
- Internalization of externalities and exploration of environmental benefits
- River basin as the natural geographical and hydrological management unit

Marine Strategy Framework Directive (MSFD)

The EU's main tool to protect and conserve the health of our coasts, seas and ocean is the MSFD. It consists legally-binding and operational principles for managing the EU's entire marine environment. The MSFD is a cyclical process that include the following key processes:

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EU MISSIONS RESTORE OUR OCEAN & WATERS

Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

Mar Piccolo di Taranto, Taranto - Italy Demonstration site

The major industrial settlements around the urban area of Taranto are the Steel plant of Acciaieria d'Italia, Ex ILVA (among the largest in Europe), the ENI refinery and the Cementir (cement factory). Some areas of the Mar Piccolo, especially those adjacent to the naval shipyards, have high concentrations of mercury and PCBs. Marine sediments represent an extremely complex environmental issue for this area. Furthermore, investigation of other pollutants, like pesticides, pharmaceuticals, PFAS hasn't been done so far, although they are likely present.

Mar Piccolo is an example of Mediterranean coastal marine ecosystem whose biological balances have been modified as a result of the considerable environmental stress due to the development of human activities. Therefore, Mar Piccolo basin reflects the negative effects of pollution because of its semi-enclosed shape with remarkable problems of water exchange, which are mainly due to moderate sea tides. The seabed of this coastal basin are severely contaminated by metals, PAHs and PCBs.

The Italian demo-site is located in the "Mar Piccolo," which is a coastal basin north of Taranto. Specifically, in the I bay of Mar Piccolo, the site of the SGM srl shipyard will act as a base for capturing and treating waters from the Citrello canal that flow into the inlet. Moreover, the microalgae plant will treat water contaminated by sediment in a reservoir in order to evaluate ex-situ remediation of contaminated dredged sediment.

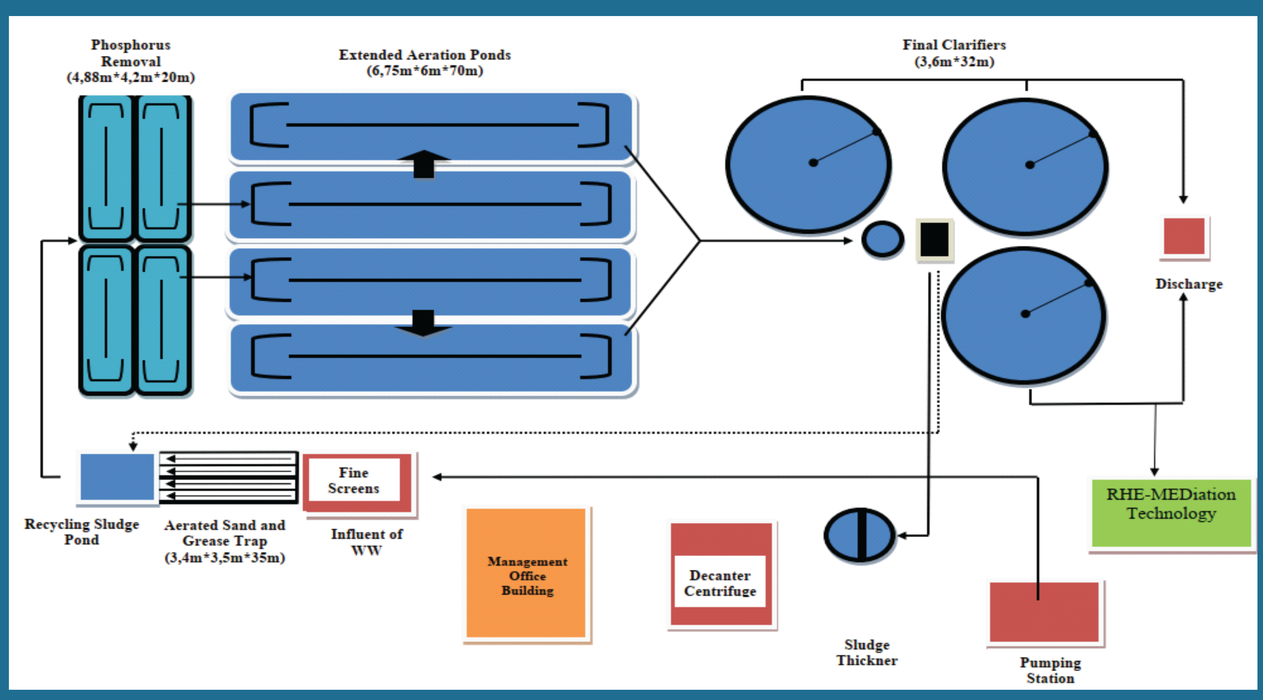
The planned position for the microalgae bioreactors is in S.G.M. shipyards (area outlined in green in the left image), whilst the proposed area for monitoring with mobile measurement station is in I bay from Mar Piccolo.

Thriasio WWTP, Athens - Greece Demonstration site

The Thriasio Wastewater Treatment Plant (TWWTP) serves as the demo-site in Greece. It is located West of Athens and it serves the Municipalities of spropyrgos, Elefsina, and Mandra-Idyllia, also receiving pre-treated liquid waste from nearby industries and businesses. The Thriasio WWTP has been operating since 2012, eliminating phenomena of absorbent cesspools and uncontrolled sewage discharges that were common practice in the area. Treated sewage is discharged to the sea of Elefsis Gulf, meeting all the current compliance criteria required by European and national regulations.
Demo Site, consists of an integrative tertiary process at the WWTP outlet, using microalgae photobioreactors (yellow box, left image), to remove undesired chemicals that conventional WWT technologies do not treat. Membrane filtration equipment based on industrial micro and ultra-filtration solutions will be used to collect microalgal biomass and obtain an effluent with excellent discharge characteristics, even suitable for re-use.
A monitoring system will be deployed, composed of fixed installation at the WWTP outlet and mobile, autonomous drifters in the Elefsis Gulf.

Dilovas Municipal WWTP, Izmit Bay - Turkey Demonstration site

The Dilovası Municipal Advanced Biological Wastewater Treatment Plant serves as the demo-site in Turkey. The Dilovası WWTP is located in the east/northeast of the Marmara Region and plant treats domestic wastewater and waste-water originating from industries. It has been operating since 2017. The discharge of the treatment plant reaches the Izmit Bay via Dilderesi meeting all the current compliance criteria required by Turkish national regulations. It is operated as extended aeration activated sludge process integrated with phosphorous removal capability.
There is also rapid sand filter and UV disinfection for further treatment in order to supply industrial water needs.



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Responsive hub for long term governance to destress the Mediterranean Sea from chemical pollution

The stakeholders engagement life cycle

Citizens empowerment models upscaled from local to national and EU level.

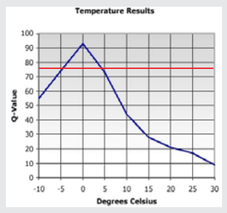
Components of the engagement	Focus groups	Get involved	Democratize the process	Influence the outcome

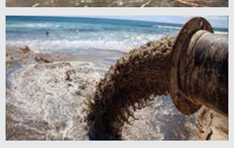
RHEMEDiation
- State of WT/WWTP effluent
- State of the receiving Sea
- Simple mapping tools

WFD
- State of WT/WWTP effluent
- State of the receiving Sea
- Simple mapping tools

CITIZEN SCIENTISTS

- PCBs
- PFAs
- Pesticides
- Fertilizers
- Forever chemicals
- Pharmaceuticals
- Heavy metals
- Chemicals
- PAHs
- Social Media
- Images etc.





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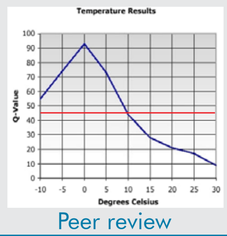
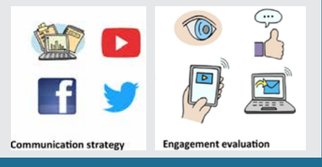
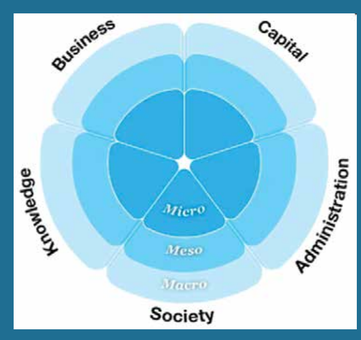


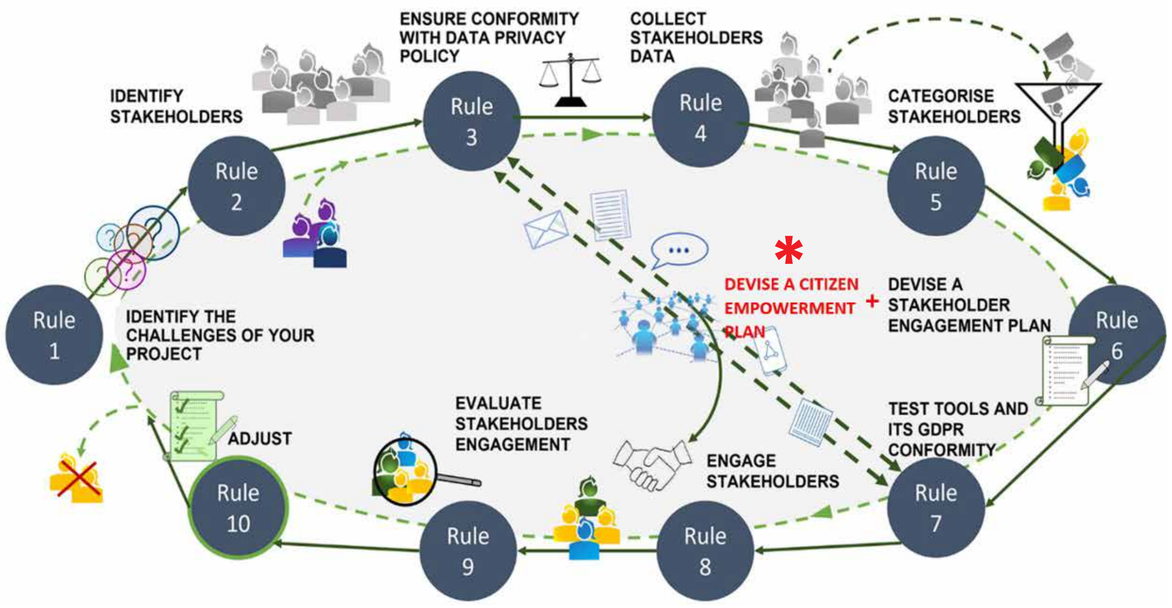
Peer review





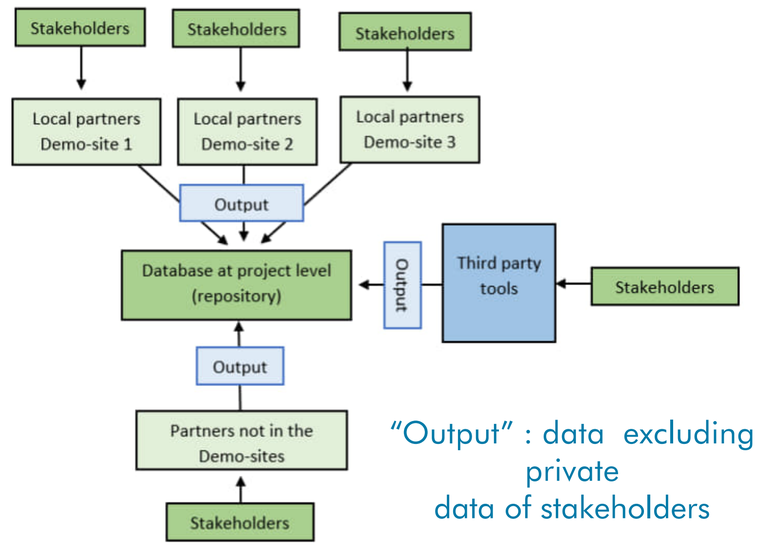
Expectation: Based on their knowledge of the WT/WWTP effluent and the receiving seawater quality, WFD-EQS, Impact of contaminants, empowered citizen scientists will liaise with government officials and other stakeholders for better funding, laws, policies, etc., regarding water quality. This engagement continues irrespective of the project's end or outcome.

The stakeholders engagement life cycle[1] sightly modified to incorporate the citizen empowerment plan



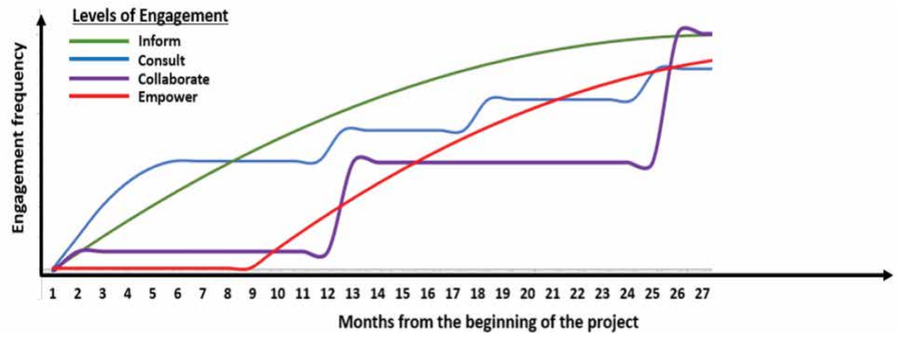
1. Hollmann S., Regierer B., Bechi J., Tobin L. and D'Elia D., "Ten simple rules on how to develop a stakeholder engagement plan," PLoS Computational Biology, 2022.

Direction of Stakeholders data flow in the RHE-MEDiation project



"Output" : data excluding private data of stakeholders

1	Workshop - 1: Introduce the project and model to local stakeholders
2	Workshop - 2: Will inform stakeholders about tasks to be carried out in WP4
3	Workshop - 3: Reports to stakeholders the results of the piloting activity in WP4



WP/ Task	Description of WP/Task	2023							2024								2025													2026				
		1 Jun	2 Jul	3 Aug	4 Sep	5 Oct	6 Nov	7 Dec	8 Jan	9 Feb	10 Mar	11 Apr	12 May	13 Jun	14 Jul	15 Aug	16 Sep	17 Oct	18 Nov	19 Dec	20 Jan	21 Feb	22 Mar	23 Apr	24 May	25 Jun	26 Jul	27 Aug	28 Sep	29 Oct	30 Nov	31 Dec	32 Jan	33 Feb	34 Mar	35 Apr	36 May
WP1	**RHE-Mediation Hub Ecosystem development**																																		
Task 1.1	Setting up of demo-sites network strategy.					1																													
Task 1.2	Development collaborative actions with local stakeholders to design the demo-site evaluation					★																													
Task 1.3	Up-scaling process of liaison with authorities and policy makers of the demo-sites member state from local to national levels																																		
WP3	**RHE-Mediation piloting: implementation and setting up**																																		
Task 3.1	Italian demo-site characterisation, procurement, and installation of technologies																																		
Task 3.2	Greece demo-site characterisation, procurement, and installation of technologies																																		
Task 3.3	Turkish demo-site characterisation, procurement, and installation of technologies																																		
WP4	**RHE-MEDiation piloting: validation, demonstration and data monitoring follow-up**																																		
Task 4.1	Italian demo-site testing, performance evaluation and endurance																																		
Task 4.2	Greece demo-site testing, performance evaluation and endurance														★ 2													★ 3							
Task 4.3	Turkish demo-site testing, performance evaluation and endurance																																		

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