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

D1.3 – Up-scaling process of liaison with authorities and policy makers of the demo-sites member state from local to national report

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LIST OF ACRONYMS AND ABBREVIATIONS

AA-EQS	Annual Average – Environmental Quality Standards
EC	European Commission
EMODnet	European Marine Observation and Data Network
EU	European Union
GDPR	General Data Protection Regulations
GR	Greece
HE	Horizon Europe
HLS	High-Level Stakeholders
KS	Key Stakeholders
NBS	Natural Based Solution
NGO	Non-Governmental organizations
NPO	Non-Profit organizations
SHs	Stakeholders
TG	Target Group
TR	Türkiye
WFD	Water Framework Directive
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

D1.3 reports about actions put in place to liaise with local authorities and policy makers to attract their attention about the demo-site mission within own state mission strategy, thus, to maximise impact effects and related evaluation from local to national level.

The approach adopted in RHE-MEDiation included the organization of high-level stakeholder peer-to-peer interviews in order to inform and to have their liaison. These interviews aim to receive the information about their perception on EU Missions (how important is the chemical pollution issue in the countries' priorities, what is the major obstacle to reduce chemical pollution impact of hotspots, does the countries have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve the goals) and RHE-MEDiation solutions (what are the potential challenges foreseen during scaling up of the RHE-MEDiation treatment process in the countries, are they interested to collaborate with the project etc.)

The document essentially covered the background information provided, including the stakeholder analysis and mapping, country level synthesis of hotspots that is in line with RHE-MEDiation objectives and results of the engagement activities.

Demo-site engagements across three countries highlighted a shared understanding of chemical pollution as a major global challenge. While there was unanimous agreement on the need for comprehensive solutions combining technology and policy interventions to address pollution hotspots, awareness of EU Missions was low at the national level. Regional and local stakeholders expressed keen interest in collaborating on EU-funded projects. Notably, RHE-MEDiation has been positively received by HLSs and it was considered among the possible actions useful for achieving the mitigation of chemicals. To facilitate upscaling, addressing knowledge gaps, cost concerns, and logistics surrounding space, waste, and personnel will be crucial.

Moving forward, continuous information exchange between technical/scientific entities is planned. Once initial experiment results are available, meetings with regional and national governments will follow.

1 INTRODUCTION

1.1. Background

Addressing the pressing issue of chemical pollution in the Mediterranean and safeguarding its waters have become paramount in our era. The continuous contamination and unsustainable usage over many years have placed immense stress on the entire water cycle, from its origins to the sea, resulting in severe harm to marine ecosystems.

The EU Mission, "Restore our Ocean and Water," is committed to preserving and revitalizing aquatic environments. Its objectives include preventing and eliminating pollution, making the blue economy environmentally friendly and sustainable through research, innovation, public involvement, and investments. To achieve these goals, the mission has established four "Lighthouses." These Lighthouses serve as central hubs for developing, demonstrating, and implementing novel solutions, spreading their impact far and wide, and guiding us on our journey to restore our oceans and waters. Specifically, the "Mediterranean Lighthouses" works towards a healthy and pollution free Mediterranean Sea.

The Mediterranean Sea accounts for about 7.5% of the world marine biodiversity and 15% of the global maritime traffic, yet it is one of the most polluted seas in Europe [R3]. Restoring and protecting the Mediterranean and its waters from chemical pollution is one of the most urgent challenges of our time. In this regard, Within the realm of the "Mediterranean Lighthouses," RHE-MEDiation project deploys cutting-edge Natural Based Solution (NBS) for mitigating the chemical pollution in the Mediterranean Sea.

RHE-MEDiation plays a crucial role, emphasizing regional collaboration and cooperation to support policymakers' efforts. The NBS to be deployed by RHE-MEDiation project can be seamlessly integrated into existing water and wastewater treatment systems and are complemented by mobile and stationary sensing systems whose primary purpose is to detect and quantify chemical substances in both land and marine waters. The collected data is then transmitted to the EC EMODnet platform, contributing to the Digital Twin of the Ocean. The effectiveness of these proposed solutions in decontaminating waters from chemical contaminants before they reach the sea hinges on the demonstrated efficiency of an integrated framework. This framework facilitates upscaling, commencing with validation and demonstration at local demonstration sites and extending to evaluation and assessment at local, national, and ultimately EU levels.

Adopting an interdisciplinary approach, this project aims to enhance the Mediterranean Sea's resilience against chemical pollution across three countries (Italy, Greece, and Turkey). It envisions expanding its influence to encompass an additional five Mediterranean basin countries.

The overall project activity is distributed across eight work packages (WPs), and this deliverable will primarily focus on WP1, Task 1.3, up-scaling process of liaison with authorities and policy makers of the demo-sites member state from local to national level.

In Task 1.3, the goal is to establish agreements with local and national-level authorities and policymakers to facilitate the scaling up of the proposed strategy to national references. In this regard, the RHE-Mediation ecosystem created between site owners and local stakeholders in Tasks 1.1 and 1.2 will be enlarged in Task 1.3 by inviting authorities from local to national levels, whose different roles may influence the way the proposed RHE-MEDiation actions, and more generally, all actions nurtured by the lighthouses project, to clean discharged waters from the unregulated chemical pollutants are endorsed. This is because, depending on the established rules, local need may differ from national strategies. Alignment as well as disalignment is to be identified and discussed, and a common way to maximise synergies with the support of stakeholders at large

be secured. The output from T1.3 will be useful also to approach the up-scaling attitude of states other than those considered for the project demonstration and related to the 5 “associated regions” expected to be tackled in WP5.

1.2. Aim of Deliverable

This deliverable will detail actions put in place to liaise with authorities and policy makers, from local to national levels, to attract their attention about the demo-site mission within own state mission strategy, thus, to maximise impact effects and related evaluation from local to national level.

1.3. Deliverable Structure

Deliverable 1.3 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 country level synthesis of hotspots that is in line with RHE-MEDiation objectives, identified stakeholders (policy makers and local to national level authorities), mode of engagements.
- Section 3 details the results of engagement activities discussed separately for each demo-site.
- Section 4 synthesizes section 3 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 [11].

2.1 Background Mapping

As detailed in D.1.1, the Penta-helix model, with five target groups: Capital, Businesses, Administration, Civil Society, and Knowledge, was adopted for stakeholder mapping at the RHE-MEDiation demo-sites. This mapping was further refined by categorizing each target group into different high-level stakeholder groups, as presented in *Table 1*[1]. Subsequently, potential stakeholders representing those HLS groups were identified, and formal channels were used to have them join as stakeholders of the project.

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

ID.	Capital	Businesses	Administration	Civil Society	Knowledge
A	Water utilities	3rd party contractors that may be involved in the project	Authorities	Citizens	Universities
B	Wastewater treatment plants owners	that may use the generated effluent	Policy Makers	Civil society organizations	Research and development centers, including national and local laboratories.
C	Public Investor	Financial opportunity developers			Professional experts, associations, consulting companies
D	Private Investors	that generate wastewater			
E	Financial Institutions	that are impacted by the HOTSPOTS			

Before commencing Task 1.2, which involved designing the demo-site evolution report, the project team conducted an online survey for stakeholder mapping and analysis. This survey targeted the stakeholders who had joined the project at the demo-sites. The primary aim was to utilize data gathered to strategically plan engagement activities at the RHE-MEDiation demo-sites.

The survey results revealed the following key information:

- In the Capital target group, despite the lack of results that typically attract investors interest at this stage of the project, a moderate level of interest from both private and public investors in engaging with project activities was observed. For financial institutions, the anticipated level of engagement was categorized as 'informed.' Moreover, stakeholders in the latter group were open to more active collaboration with the project. A few water and wastewater utilities have requested an 'informed'

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

level of engagement, while all others in this HLS chose to collaborate with the project. In light of these findings, the project has decided to proactively engage with stakeholders in this target group to enhance their participation.

- In the administrative target group, a higher level of interest was observed among policymakers than initially anticipated in the planning phase. However, several stakeholders within this group expressed a desire for 'informed' level of engagement. Consequently, the project will devise strategies to enhance their participation. As per to local authorities, a higher level of interest and participation was observed. Efforts to engage more stakeholders in this HLS will be the project's focus in upcoming activities.
- The involvement of citizens and civil societies in the survey was limited; however, data collected indicated that the actual interest fell within the expected range.
- The Knowledge target group displayed a high level of interest, as expected during the strategy development phase. Nevertheless, the project will need to exert efforts to invite more stakeholders from this group to join the project.
- For the business target group, despite limited participation from various businesses in the survey, the collected data indicated that their interests are aligned with expectations. In upcoming activities, the project will make concerted efforts to invite more stakeholders from this group to join.

The data gathered from this survey will be instrumental in shaping the project's engagement strategies at the demonstration sites. These strategies include organizing activities to maintain interaction with existing stakeholders and to engage new participants for the demo-site stakeholder reference groups.

As delineated in Task 1.3 and in following tasks within WP1 (Tasks 1.4 to 1.7), the project will broaden the RHE-MEDiation's Ecosystem by identifying and connecting with more stakeholders beyond the demonstration sites. In this regard, the procedure for stakeholder identification and their subsequent invitation to join the project will be conducted on a recurring basis. In the sub-sections to follow, along with numerous other insights, a comprehensive overview is provided of these exercises for Task 1.3.

2.2 A review of HOTSPOTS within the demo-site countries

RHE-MEDiation aims to advance the destress capability against chemical pollution in identified HOTSPOTs in the Mediterranean Sea across three countries (Italy, Greece and Türkiye), with a strategic vision to expand its impact to encompass five additional countries of the Mediterranean basin. Within the scope of the RHE-MEDiation objectives, HOTSPOTs refer, polluted areas in terms of chemical parameters.

In this section, the chemically polluted areas in the Mediterranean Sea and the point source pressures will be explained for each demo-site country in order to determine the scaling-up capacity of RHE-MEDiation solutions to remediate the Mediterranean Sea.

2.2.1 Türkiye

Contaminants are measured in sediment matrices within scope of National Integrated Pollution Monitoring Program in Turkish seas under the cooperation of TUBITAK with the official and financial support of the Ministry of Environment, Urbanization and Climate Change. It was reported that formerly used DTT's were dominated in most of the sediment samples from Iskenderun Bay in the Easternmost Mediterranean (Asi and Ceyhan River Basins) during the 2014-2019 period, while other organic pollutants (PCBs, other pesticide compounds and PAHs) and metals (Lead, Cadmium, Zink and Mercury) were below the ERL (Effect Range Low-Long and Morgan 1990) values [R9]. Other evaluation was also carried out on a pilot scale between 2013-2014 in scope of the KIYITEMA Project (under the coordination of TUBITAK and supported by Min. of. Agr.

Forestry) for the contaminants in the water matrix according to the Water Framework Directive. The coastal monitoring stations selected in the Mediterranean Region within the scope of the project are Iskenderun Bay (Asi River Basin) and Ceyhan Basin. The sampling points in the Iskenderun Bay were close to industrial facilities (Oil, Fertilizer, Iron/Steel etc.), the main port and municipal wastewater treatment plant. Sampling points in the Ceyhan River basin were located close to the oil pipeline and thermal power plant. The results indicated that, the metal concentrations (Chrome, Nickel and Lead) in the coastal waters of the Asi and the Ceyhan River Basins exceeded the AA-EQS values given in the directive regarding priority substances (2013/39/EU). Organic pollutants such as PAHs (Fluoranthene, Naphthalene and Anthracene) were also detected at higher levels than their AA-EQS values. The synthetic pollutant concentrations (Atrazine, Diuron, Terbutryn and Pentachlorobenzene) also exceeded the AA-EQS values in the coastal area of the Asi River Basin and the Ceyhan Basin (Eastern Mediterranean).

Coastal area of Aegean Sea of Türkiye is also monitored within the scope of the National Integrated Marine Pollution Monitoring Program. Relatively high contaminant levels were measured in the coastal sediments of Izmir (such as DDTs, pyrolitic dominated PAHs and some metals) and Aliağa Bays (PCBs and some metals) [R8]. The high contaminant levels were also detected in the water matrix measured under the scope of KIYITEMA project indicating contamination in these Bays [R2].

Point Source of Pollution

Türkiye has 25 river basins and twelve of them which border the Aegean Sea and the Mediterranean Sea (*Figure 1*) There are a total number of 87 municipal wastewater treatment plants (N>10,000 e.p.) and number of 49 industrial wastewater treatment plants (WWTP) (Q>1000 m^3/day and all industrial zones) operated within the eight different provinces. These discharges directly and/or indirectly reach the Aegean Sea and Mediterranean Sea and more than 90% of municipal WWTP operate as Carbon, Nitrogen and Phosphorus removal. 42% of total treated municipal wastewater reaches the Aegean Sea, rest reaches Mediterranean Sea in line with national discharge standards that take consideration of Carbon, Nitrogen and Phosphorous limits in order to eliminate Eutrophication risk [R4].

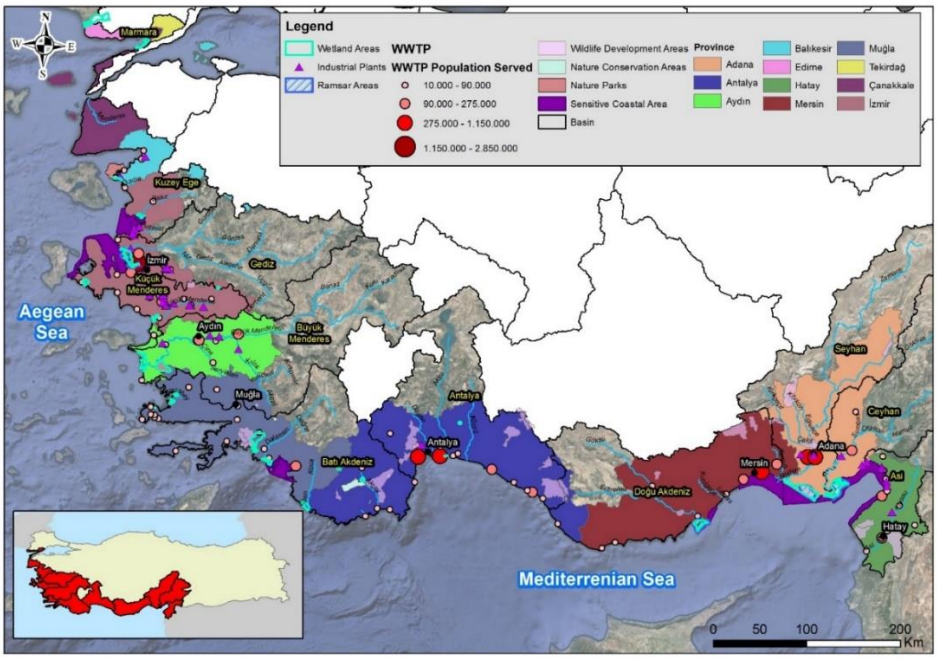

Figure 1: Land based point pressures on Mediterranean region [R4].

The provinces of İzmir, Antalya, Adana, and Mersin are the most important pressure factors for municipal wastewater treatment plants located on the coast (*Figure 2*), while the provinces of İzmir and Hatay (İskenderun) are the most important pressure factors for heavy industries located on the coast. These current pressures are in line with the water quality and sediment analysis results given in the previous section, which were prepared by considering the scientific studies and published reports. Therefore, we can say that İzmir, Adana, Mersin, and Hatay provinces are potential regions where RHE-MEDiation technology can be used to reduce chemical pollution [R2].

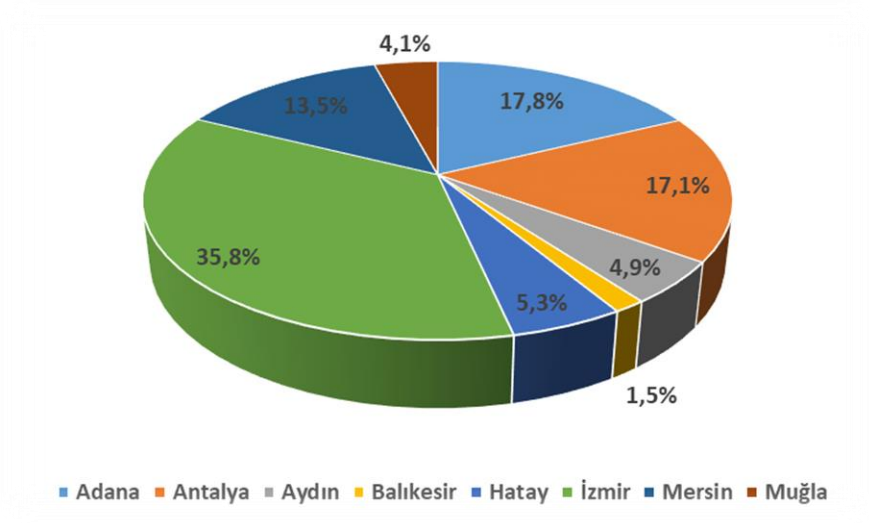

Figure 2: Ratio of treated municipal wastewater discharges based on provinces in Mediterranean coast of Türkiye.

2.2.2 Greece

2.2.2.1 Present state and challenges of Urban Wastewater Treatment in Greece

Development of wastewater treatment plants in Greece over the past 4 decades

The modern era of development of wastewater management in Greece was initiated in the early 1980s, when the country entered the EU, and had to comply with the respective EU policies for proper urban wastewater treatment. Up to that point sewage was discharged without any treatment in nearby streams, rivers, or the sea. Nowadays, Greece fully complies with the requirements of Urban WasteWater Treatment Directive, Directive 91/271/EEC, as amended by the Directive 98/15/EU, aiming to protect the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors [1].

To date, Greece has accomplished wastewater infrastructure construction to a large extent, as 91% of the country's population of approximately 11 million people is connected to urban WWTPs (*Figure 3*). Overall, 254 WWTPs have been installed and operate in Greece [1], the two major ones being the WWTPs of Psyttalia and Thessaloniki, serving Athens, the capital city of Greece, and Thessaloniki, the second major city, respectively.

In 1994, the Psyttalia WWTP started its operation and today serves approximately a population of 4 million [R6]. It constitutes one of the largest WWTPs in Europe (and internationally), with a population equivalent (p.e.) coverage of 5,600,000 p.e.. The average flow rate of incoming sewage is about 1,000,000 m^3/day. The treated effluent is mainly discharged to the nearby Saronikos Gulf, which is characterized as a sensitive marine area (see *Figure 4*). The WWTP of Thessaloniki was fully operable in 1992, currently serving about 1 million residents of the greater metropolitan area of Thessaloniki, treating daily around 160,000 m^3 with a potential

treatment capacity (after extension) of approximately 300,000 m^3/day. The treated effluent is mainly discharged to the nearby Thermaikos Gulf, which is characterized as a sensitive marine area as well [1][R6].

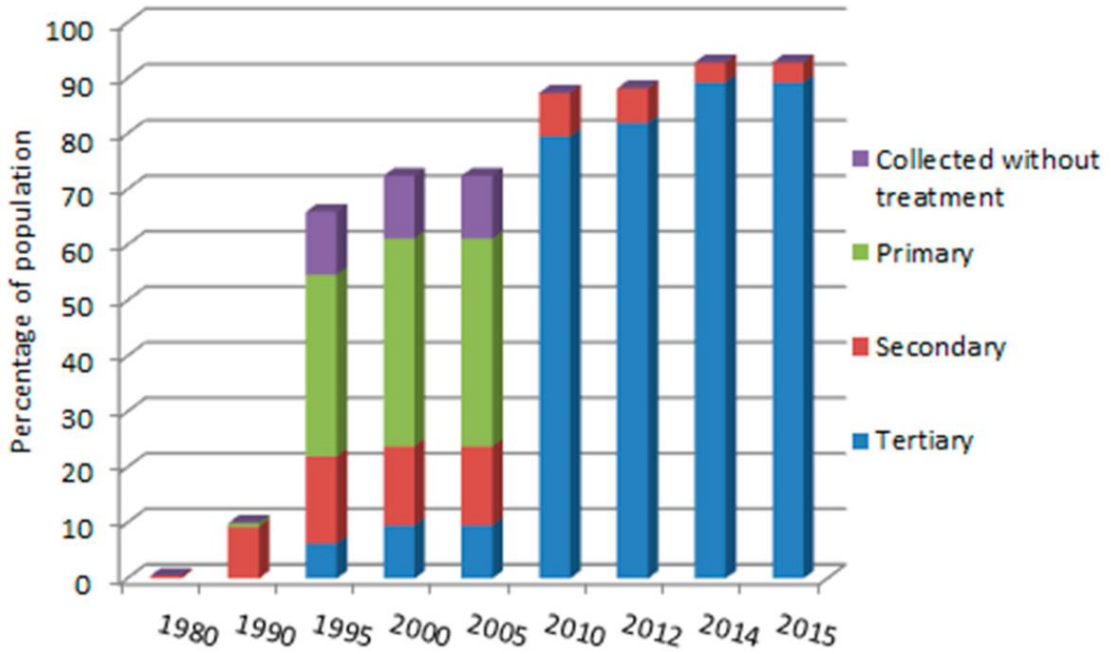

Figure 3: Development of urban wastewater treatment plants in Greece during 1980–2015 [R6]

In 2012, the National Database of the Urban Wastewater Treatment Plants was created by the Special Secretariat for Water (SSW) of the Greek Ministry of Environment and Energy, in the framework of the requirements of the Directive 91/271/EEC, supported by the European Commission Directorate-General for Regional and Urban Policy. This Database presents all the relevant information in an advanced Geographical Information System (GIS), easily accessed by everyone interested via the respective webpage "SSW—Wastewater Treatment Plants". It constitutes an interactive tool for the immediate and continuous monitoring of the implementation progress of the Directive in Greece at [1].

Within the Database, specific information regarding the location, capacity, performance, means of disposal, or reuse of wastewater and sludge, as well as the Environmental Terms of each WWTP are stored and are easily publicly accessible. *Figure 4* illustrates the map of WWTPs in Greece, as presented on the Ministry of Environment and Energy webpage at [1]. In this figure the WWTPs in compliance with the requirements of Directive 91/271/EEC are indicated by blue dots (which are representing the majority, i.e., 168 out of 254). The figure also indicates in red colour dots the WWTPs that are not still compliant with the Directive, either because they do not collect a sufficient number of samples per year, or because the effluent is beyond the respective limits set by the Directive. Each dot size is logarithmically related to the capacity of the WWTP.

Figure 4: Map of the WWTPs in Greece (The red arrow points to Psyttalia WWTP and the black one to the Thessaloniki WWTP) [1].

Management of wastewater from small urban settlements

However, in Greece, there are many agglomerations with less than 2000 inhabitants, which account for almost 2.5 million p.e., where neither sewage networks nor wastewater treatment are legally enforced, unless the wastewater is discharged to sensitive water bodies (*Figure 5*). For the majority of wastewaters that originate from small villages, as well as from the lots of decentralized holiday residences in Greece, septic tanks/soil absorption systems remain the predominant option for sewage treatment. However, the exact number of these systems is to a large extent unknown, since they are seldom formally registered.

This flexibility in the application of appropriate treatment technologies shifted interest towards the operation of alternative technologies for small communities, but more or less to a limited extent. Sequencing Batch Reactors (SBR) exist in Greece, but they are not widely operated. Natural treatment systems, such as Waste Stabilization Ponds (WSP) are also quite limited. The same applies in the case of Membrane Biological Reactors (MBR systems) and other combinations of treatment techniques, such as MBR-RO (Membrane Biological Reactors - Reverse Osmosis). The operation of alternative technologies for the wastewater treatment of small communities has not been widely accepted as the feasible alternative to the conventional wastewater treatment systems in Greece. This can be attributed to the fact that their application has not been accompanied with a parallel effort to gain wider community acceptance over the conventional wastewater treatment systems, which were already widely applied, broadly tested, and considered as more reliable solutions [R7].

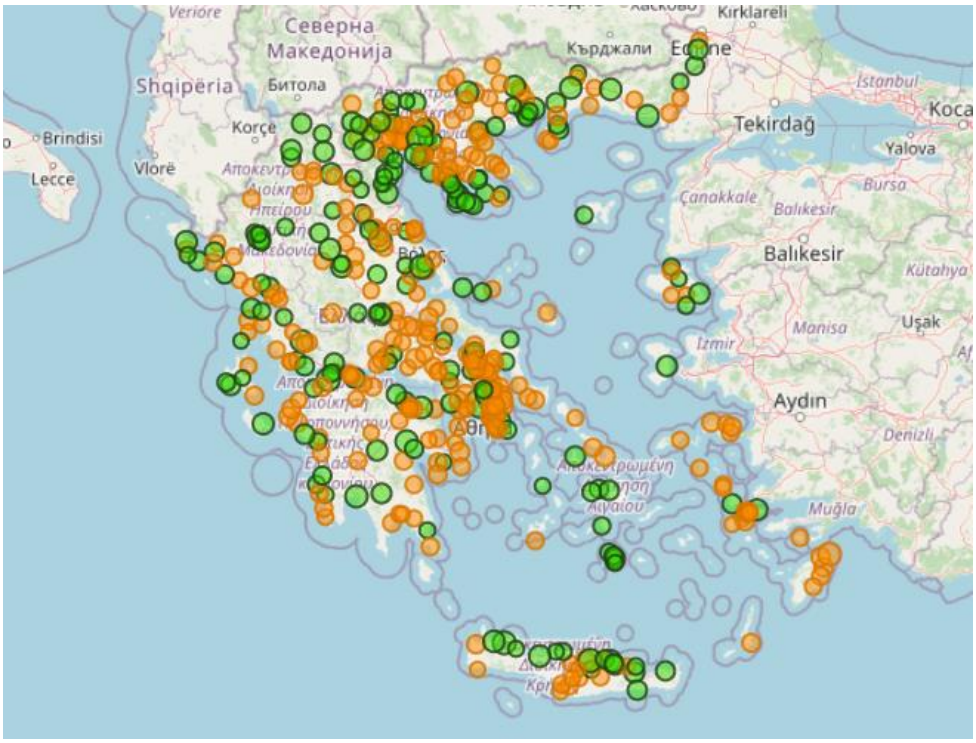

Figure 5: Map of Greece's agglomerations (green dots; Planned or completed or partially completed WWTP projects, orange dots; Not planned WWTP projects – funding is not ensured to complete the required infrastructure) [1].

2.2.2.2 Lessons learned from the implementation of the Water Framework Directive (WFD, 2000/60/EC) in Greece

The national programme "Monitoring network for the ecological status quality of the inland, transitional and coastal waters of Greece" [8] entails an extended monitoring network of coastal and transitional waters for the classification of their ecological status according to the WFD. The monitoring network is delegated by the Greek water management authorities, which report annually on the water quality status to the European Environment Agency providing data sets of physical characteristics and concentrations of inorganic and organic nutrient, organic matter, chl-a, macroalgae and macroinvertebrates and hazardous substances together with the characterization of the main pressures and impacts from anthropogenic and other activities at each monitoring station, according to Annex V of the WFD 2000/60/EC [5].

Regarding the anthropogenic pressures in the coastal zone of Greece which affect the environmental status of the coastal marine waters, a pressure index derived from [R1] has been applied for the Greek water bodies monitored within the WFD implementation, in order to evaluate the magnitude of the anthropogenic pressures induced (*Figure 6*).

In *Table 2*, following this methodology, a pressure intensity scale is defined from 0 (low) to 3 (high) providing values for each pressure type within the corresponding area. The classification of the pressures was based on the Water Information System for the European (WISE-SoE) reporting system for coastal and marine waters [3] and data available through the WFD Article 5 implementation in Greece. The pressure types include sewage discharge, industrial discharge, other discharges, spoiled waste, other waste, mariculture, fishing, marinas, ports, and other activities [R5].

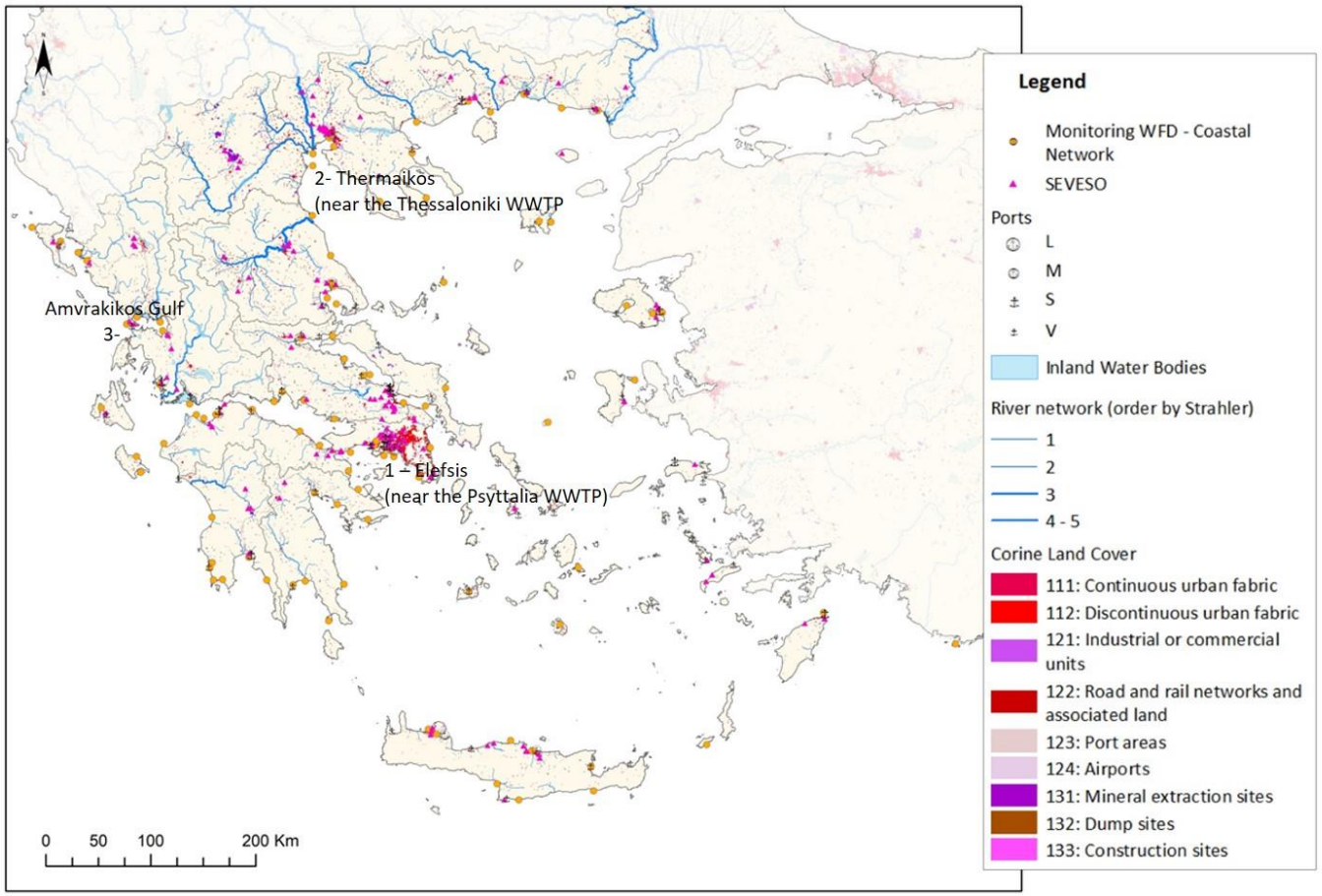

Figure 6: Selected anthropogenic pressures in the coastal areas of Greece and the mainland (numbers denote heavy pressure areas as described in Table 2) [HCMR & EYDAP, 2023 unpublished]

Table 2 : Different pressures affecting selected Greek coastal stations, the Pressure Index and types of pressure

Stations/Pressures	Sewage Discharge	Industrial Discharge	Agricultural discharges	Spoil Wastes	Mariculture	Fishing	Marina	Ports	Other Activities	Pressure Index	Pressure Type
Limnos Island	0	0	0	0	0	1	0	0	1	0.22	NO PRESSURE
W. Patraikos	1	1	1	0	1	1	0	0	1	0.67	LIGHT PRESSURE
S. Patraikos	1	1	1	0	1	1	0	0	1	0.67	LIGHT PRESSURE
Argostoli	1	0	1	0	2	1	1	0	1	0.78	LIGHT PRESSURE
W. Saronikos-S8	2	1	0	1	1	1	0	0	1	0.78	LIGHT PRESSURE
Theologos	0	1	1	1	2	1	0	0	1	0.78	LIGHT PRESSURE
Epidavros-S25	0	0	1	0	2	3	0	0	2	0.89	LIGHT PRESSURE
Vourlias	0	0	2	0	2	2	1	0	2	1.00	MODERATE PRESSURE
Kalamas	1	1	2	0	2	1	0	0	2	1.00	MODERATE PRESSURE
E. Saronikos-S11	2	1	0	2	2	1	0	0	1	1.00	MODERATE PRESSURE
Antikyra	1	2	1	1	1	1	1	1	1	1.00	MODERATE PRESSURE
Skouries	1	3	0	2	2	1	0	0	1	1.11	MODERATE PRESSURE
Korinthos	2	1	1	1	0	1	1	2	1	1.11	MODERATE PRESSURE
Argolikos	1	0	2	1	2	2	1	0	1	1.11	MODERATE PRESSURE
Asopos	1	3	2	1	1	1	0	0	1	1.11	MODERATE PRESSURE
Itea	1	2	2	1	2	1	1	1	1	1.33	HIGH PRESSURE
Saronikos Sewage-S7	3	3	0	2	0	0	0	2	2	1.33	HIGH PRESSURE
Patra	2	2	1	1	1	1	1	2	1	1.33	HIGH PRESSURE
Faneromeni	2	2	1	1	2	1	1	1	1	1.33	HIGH PRESSURE
Larymna	1	3	1	1	2	1	0	2	1	1.33	HIGH PRESSURE
Volos	2	2	1	1	1	1	1	2	1	1.33	HIGH PRESSURE
S. Amvrakikos	1	0	2	1	3	3	1	0	3	1.56	HEAVY PRESSURE
Elefsis-S1	2	3	1	2	1	1	1	3	1	1.67	HEAVY PRESSURE
Thermaikos-TP16	2	2	3	1	3	2	1	0	1	1.67	HEAVY PRESSURE
Amvrakikos-Louros	1	0	3	1	3	3	1	0	3	1.67	HEAVY PRESSURE
Amvrakikos-Arachthos	1	0	3	1	3	3	1	0	3	1.67	HEAVY PRESSURE
Thermaikos-TP10	3	3	2	1	2	2	1	2	2	2.00	HEAVY PRESSURE

2.2.3 Italy

The Taranto area, chosen as HOTSPOT in the RHE-Mediation project, is one of the SIN sites, or Sites of National Interest (*Figure 7*). These Sites are large portions of the national territory, of particular environmental value and include all the various environmental matrices (including any surface water bodies and their sediments), identified by law, for reclamation purposes, on the basis of characteristics (of contamination and others) that entail a high health and ecological risk due to population density or the extension of the site itself, as well as a significant socio-economic impact and a risk for assets of historical and cultural interest. SINs are identified by decree of the Ministry of the Environment and Energy Security in agreement with the Regions concerned, after consulting the municipalities and other local authorities, ensuring the participation of those responsible as well as the owners of the areas to be reclaimed, if different from the responsible parties [9].

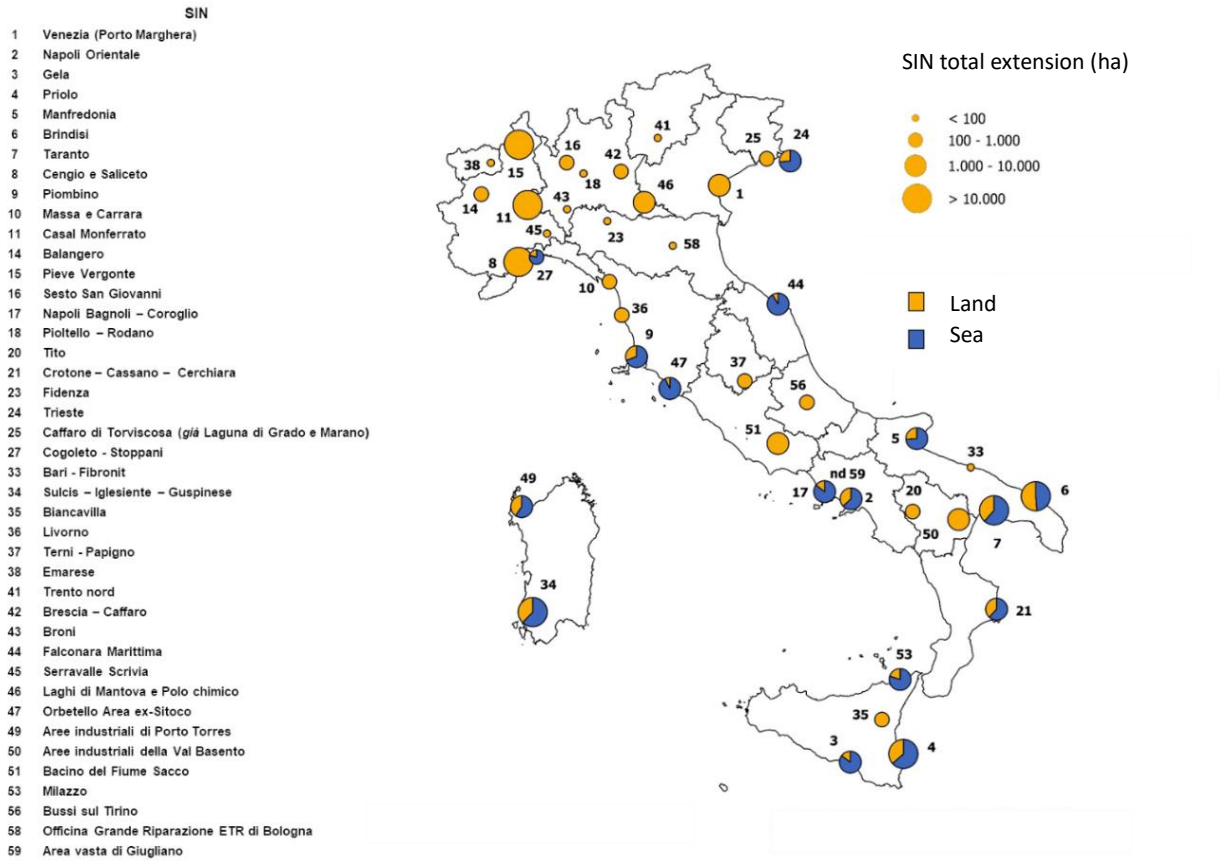

Figure 7: Sites of National Interest in Italy [9].

The perimeter of SINs may change over time with increases or reductions in the areas involved on the basis of new information on potential and/or ascertained contamination of new areas or on the basis of a more accurate definition of the areas affected by potential sources of contamination.

These localities have a territorial extension in some cases also covering marine areas, such as, in addition to Taranto, Manfredonia and Brindisi in Apulia, Trieste in Friuli Venezia Giulia, Cogoleto-Stoppani in Liguria, Piombino and Orbetello former Sitoco area in Tuscany, Falconara Marittina in Marche, Napoli Orientale and Napoli Bagnoli-Coroglio in Campania, Crotone-Cassano-Cerchiara in Calabria, Gela, Priolo and Milazzo in Sicily, Sulcis-Iglesiente-Guspinese and the Porto Torres industrial areas in Sardinia. The total extent of the sea areas included in the SINs is approximately 77,000 hectares [2].

To date, 42 Sites of National Interest have been identified, for a cumulative surface area that constitutes approximately 6 per thousand of the national territory (about 170,000 hectares in total on land and about 78,000 hectares at sea); a registry of the SINs with a summary descriptive sheet and georeferenced graphic representation is available at the address [2].

2.2.3.1 Taranto, Naples-Bagnoli and Venezia Porto Marghera

Of all sites most similar to the project study site, in terms of the industrial activities conducted that impacted the environment and also the type of pollutants, are Naples-Bagnoli and the Porto Marghera area.

These three sites have also been identified as representative for the entire Mediterranean Sea marine area, which for the Italian seas has had a further subdivision defined by the Marine Strategy Framework Directive 2008/56/EC (MSFD): Western Mediterranean (to which Campania belongs), Adriatic Sea (which bathes Veneto), Ionian Sea and Central Mediterranean (relating to the Apuglia region) (*Figure 8*).

Taranto site covers a vast flat area (4383 hectares on land and 7005 hectares at sea), overlooking the Gulf of Taranto, where the present industrial settlements heavily influence the socio-economic, environmental and landscape framework. Among the different industrial plants present, the largest Italian steel plant Ex ILVA stands out, together with the Eni refinery, the CEMENTIR cement plant and other small and medium-sized manufacturing industries. Industrial activities have impacted all environmental compartments, and the main sources of pollution are the steel, oil and cement industries and the Military Arsenal. Remediation and environmental restoration activities concern industrial areas, marine (Mar Piccolo) and brackish (Salina grande) areas [2].

The 'Bagnoli-Coroglio' site is located in the western area of Naples facing the Gulf of Pozzuoli and covers an area of approximately 249 hectares on land and 1453 hectares at sea. The area's industrial history is dominated by the Ilva steel plant in Bagnoli, flanked by the Eternit plant. In the 1980s there was a progressive downsizing of the production apparatus, with the closure of activities in 1990-1991 [2].

The Venice Site included 3,221 hectares of land areas, 350 hectares of port canals and 2,200 hectares of lagoon area and includes the following activities: refinery, integrated chemistry (Old and New Petrochemicals), steelworks [2].

In Taranto, as well as in Naples-Bagnoli and Venice-Porto Marghera, the types of contaminants present in surface soil, deep soil and groundwater, where present, are metals (Zn, Pb, Sn, As, Hg and Cu), organic compounds (PAH, C>12 heavy hydrocarbons and PCBs) and organo-chlorinated compounds. In Veneto, the presence of PFAS is also a focus of attention [2].

Figure 8: Sites of National Interest: A -Taranto, B - Napoli-Bagnoli, C -Venezia Porto Marghera [10]

Moreover, since the project is based on the use of a technology that is also useful for the treatment of wastewater from purification plants, an attempt was made to involve entities operating in the area that might be interested in potential development; there are a considerable number of urban wastewater purification plants in operation in Italy, but given the complexity of urban wastewater treatment, most of the national purification parks are managed by 247 different specialised entities. Purification plants, which are necessary to reduce pollution of water bodies and safeguard the health of the population, differ in terms of type of treatment and capacity to abate pollutant loads, and there is still a large number of small plants scattered throughout the territory.

2.3 Identified Stakeholders

Conditions specific to the country of the demo-site were considered when examining the roles of local authorities and policymakers, to select appropriate partners for project collaboration. A focus of this subsection will be highlighting these differences with the identified stakeholders.

2.3.1 Türkiye

2.3.1.1 Administrative System in Türkiye

Türkiye's administrative system consists of two levels; national and local/provincial (municipalities and villages). The central government carries out water management function in a top–down approach. The central government makes strategic decisions and plans. The provincial directorates of the relevant ministries and local administrations implement the decisions taken and the plans made. Various public and private sector organizations are directly and indirectly responsible for the management, development and protection of water resources in Türkiye.

Along with various laws in the legislation, on the topic of water use, protection and monitoring, etc. many ministries (Ministry of Environment, Urbanization and Climate Change, Ministry of Agriculture and Forestry, Ministry of Energy and Natural Resources, Ministry of Health, etc.) and institutions (Bank of Provinces, Turkish Water Institute, Water and Sewerage Administrations, Strategy and Budget Directorate, etc.) have various obligations.

From the point of chemical pollution protection, removal and remediation from the sea and water, two main ministries and their general directorates are responsible on the national level (*Figure 9*). Municipalities, water/wastewater utilities and provincial directorates of the ministry are responsible on the local level.

NATIONAL LEVEL
Ministry of Environment, Urbanization and Climate Change:

The Ministry is responsible for implementing and inspecting environmental legislation, monitoring (partially), environmental Impact Assessment (EIA), wastewater treatment plant project, treatment facility approval, tender and construction works and financing.

General Directorate of Environmental Management is responsible for a) to prepare legislation regarding the prevention and control of environmental pollution, to develop standards, to determine measurement, detection and quality criteria b) determining country policies on urban and industrial wastewater disposal and making relevant legal regulations.

General Directorate of Environmental Impact Assessment, Permit and Inspection is responsible for a) to monitor all kinds of activities and facilities aimed at preventing environmental pollution and improving environmental quality, to take the necessary measures and to have them taken, to inspect, to issue

environmental permits and licenses, b) to monitor and inspect the emissions, discharges, wastes and treatment and disposal systems of activities and facilities that cause environmental pollution.

Ministry of Agriculture and Forestry:

The General Directorate of Water Management, is responsible for determining policies regarding the protection, improvement and use of water resources, including coastal waters, monitoring the issues arising from international agreements and other legislation regarding the protection and management of water resources, monitoring the quantity and quality of surface and ground waters.

LOCAL LEVEL

Municipalities and Water and Sewerage Utilities (İSKİ, İSU, etc.) are the organizations responsible for water collection, sewerage and purification services of all districts and first-tier municipalities and all villages within the provincial borders.

Provincial Directorate of Environment, Urbanization and Climate Change is responsible for carrying out the implementation and monitoring processes of all activities aimed at preventing environmental pollution and improving environmental quality within all provincial borders, as well as all matters related to these, taking necessary measures and inspecting facilities and activities.

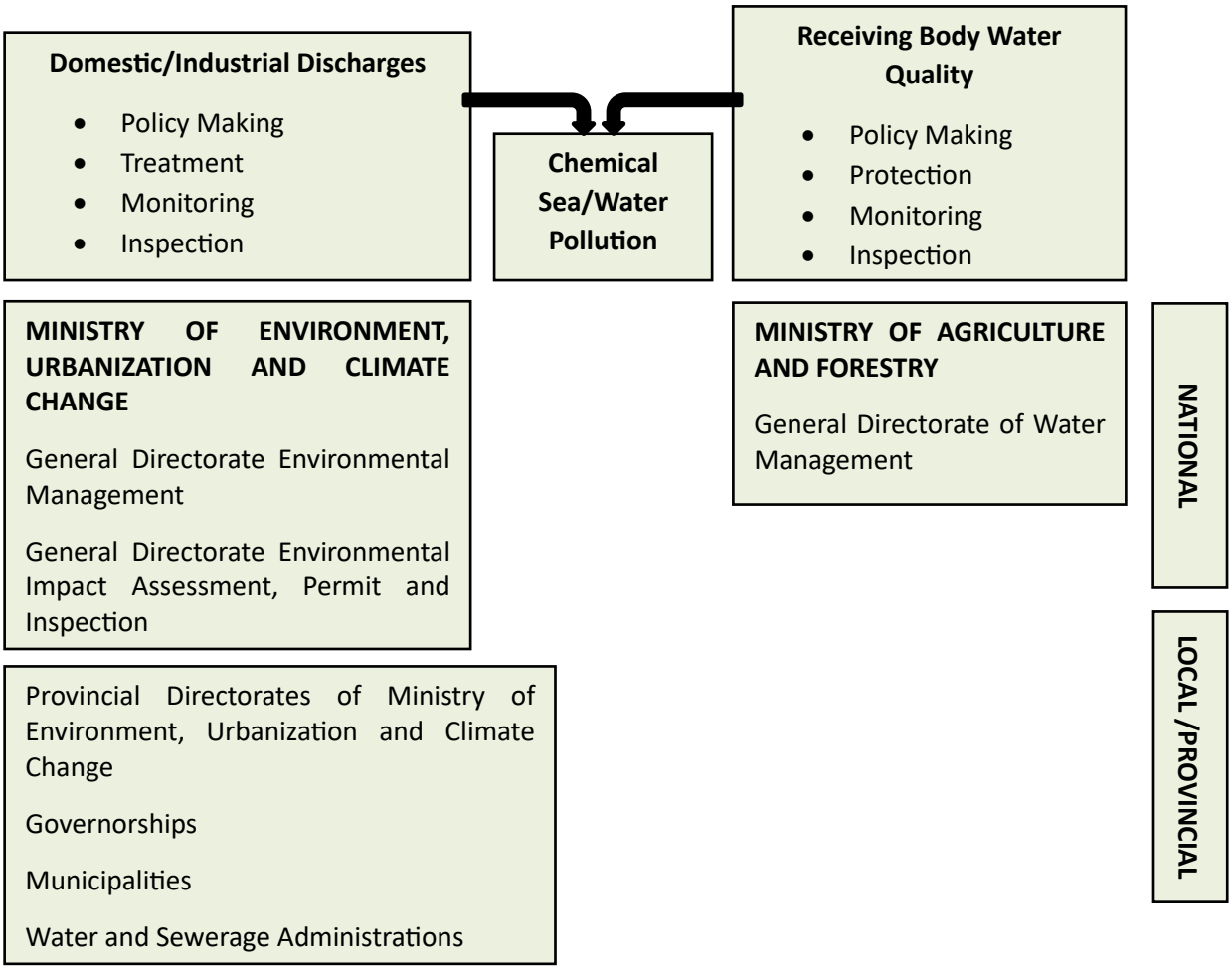

Figure 9: Administrative system in Türkiye.

2.3.1.2 Target Groups for up-scaling in Türkiye

The authorities and policymakers identified and contacted under Task 1.3 are highlighted below, with specific references to the mode and date of engagements, and the number of participants in *Table 3*.

Table 3 : Target groups and high-level stakeholder groups in Türkiye

High Level Stakeholders – Policy Makers	Whom to interview	Dates of formal meetings	Mode	Number of participants
NATIONAL LEVEL-Policy Makers				
Ministry of Agriculture and Forestry- General Directorate of Water Management	- Head of the Departments (2 participants) - Experts (2 participants)	01/12/2023	in person	4
Ministry of Environment, Urbanization and Climate Change- General Directorate of Environmental Management	- Head of the Departments (2 participants) - Experts (4 participants)	07/12/2023	virtual	6
Ministry of Environment, Urbanization and Climate Change- General Directorate of Environmental Impact Assessment, Permit, and Inspection	- Head of the Department (1 participants) - Experts (1 participants)	07/12/2023	virtual	2
LOCAL LEVEL-Authorities				
İstanbul Water and Sewerage Administration	- Head of the Department (1 participant)) - Experts (8 participant)	27/11/2023	in person	9
İstanbul-Ministry of Environment, Urbanization and Climate Change Provincial Directorate	- Head of the departments (3 participants) - Experts (2 participants)	04/12/2023	in person	5
Kocaeli Metropolitan Municipality and Water and Sewerage Administration	- Head of the Department (2 participant) - Experts (3 participants)	06/12/2023	in person	5
Kocaeli -Ministry of Environment, Urbanization and Climate Change Provincial Directorate	- Vice principle of the directorate - Head of the departments (2 participant) - Experts (2 participants)	06/12/2023	in person	5

2.3.2 Greece

2.3.2.1 Administrative System in Greece

The Greek administrative system consists of three levels from top to bottom; National/ Central (Ministries), Regional (e.g. Prefectures) and local (Municipalities). In the case of Wastewater Treatment, the central government carries out the water management function and makes strategic decisions and plans. The prefectures implement the decisions taken and the plans made. Various public and private sector organizations are directly and indirectly responsible for the management, development and protection of water resources in Greece. Along with existing legislation items and laws on the topic of water use, protection and monitoring, many Ministries (e.g. Hellenic Ministry of Environment and Energy, Ministry of Agricultural Development and Food, etc.) and Institutions (Hellenic Centre of Marine Research, General Chemical State Laboratory, etc.) have various obligations. From the point of chemical pollution protection, removal and remediation from the sea and water, two main Ministries and their General Directorates are responsible on the national level. Municipalities, water/wastewater utilities and prefecture states are responsible on the local level [4].

NATIONAL/ CENTRAL

The Hellenic Ministry of Environment and Energy works to achieve the protection of the natural environment and resources, the improvement of quality of life, the mitigation and adjustment to the implications of climate change and the enhancement of mechanisms and institutions for environmental governance. The General Secretariat of Natural Environment and Water/ Directorate General for Water under the Ministry of Environment and Energy are responsible for:

- coordinating water management issues,
- implementing the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD),
- monitoring the quality and quantity of water,
- overseeing and regulating wastewater and reuse and flood management,
- approving of all regional River Basin Management Plans (RBMPs) and Flood Risk Management Plans (FRMPs).
- engaging the public

The *National Council for Water* (NCW) is responsible for:

- developing the national strategy on the management and protection of Greek waters
- approving the national RBMP and FRMP prepared by the General Secretariat of Natural Environment and Water/ Directorate General for Water

REGIONAL

Regional authorities are responsible for licensing discharges of industrial wastewater and municipal wastewater from treatment plants.

The Regional Water Departments are responsible for:

- overseeing or preparing the RBMPs and the FRMPs in their region. The Regional Water Departments can transfer that competence to the General Secretariat of Natural Environment and Water/

Directorate General for Water, which was the case in the previous cycle of implementation for all but two Regions,
- engaging the public in the preparation of the RBMP and FRMP.

LOCAL

The Municipalities are responsible for:

- participating in public consultations for the preparation of the RBMPs and FRMPs,
- protecting and managing water resources from extensive fisheries and pollution,
- constructing, maintaining and managing local water supply, irrigation, and sewage systems.

2.3.2.2 Target Groups for up-scaling in Greece

Invitation of high-level stakeholders

In order to achieve RHE-MEDiation up-scale goals, an official invitation to a formal meeting was sent by email to high-level stakeholders representing two (2) main Target Groups (*Table 4*); Administration and Capital. The structure of the meeting was based on a one-hour agenda, including a short presentation of RHE-MEDiation project and EU mission followed by an interview of the participants. Although all the organizations accepted the invitation, they were not all available for peer-to-peer interviews.

Table 4 : High-level stakeholders and Target groups in Greece

High Level Stakeholders-Policy Makers	Whom to interview	Dates of formal meetings	Mode	Number of participants
NATIONAL/ CENTRAL - *Ministry of Environment and Energy (Administration TG)*				
General Director of Environmental Inspectors	- On behalf of the Head of the Department	27/11/2023	in person	3
General Secretariat of Natural Environment and Water/ Directorate General for Water	- On behalf of the Head of the Department	1/12/2023	virtual	2
REGIONAL *(Administration TG)*				
Prefecture of West Attica	- General Principal of Directorate - Vice General Principal - Head of the Environment Department	27/11/2023	in person	5
LOCAL *(Capital & Administration TG)*				
Municipality of Aspropyrgos	-Head of the Environment Department	27/11/2023	in person	2
Hellenic Association of Municipal Water and Sewerage Utilities	-Head of the Association -Head of Municipal Water and Sewerage Utilities (Heraklion, Rethymno, Patra)	4/12/2023	virtual	5
Thessaloniki Water Supply & Sewerage Company S.A.	-Head of the Environment Department	7/12/2023	virtual	5

It had been contacted to some other national, regional and local high-level stakeholders also. These are at national level: General Director of Inspectors and Auditors, General Director of Environmental Licensing; at regional level: Prefecture of Attica (General Directorate of Sustainable Development and Climate Change); at local level: Municipal Water Supply and Sewerage of Larissa. There will be meetings and information exchange in the following months with these high-level stakeholders.

2.3.3 Italy

2.3.3.1 Administrative System in Italy

The Italian administrative system has a top-down organisation. It is headed by Ministries, which have multiple structures subdivided by competence, composed of numerous offices that carry out their activities in application of legal provisions and government directives, although in some cases they enjoy a certain degree of autonomy. The structures generally consist of a central administration and peripheral administrations that are hierarchically subordinate and decentralised throughout the territory, even at provincial level.

The territorial authorities include regions, provinces (in the process of being abolished) and municipalities, as well as non-territorial public bodies. Although they are not hierarchically subordinate to the government, these administrative structures are nevertheless obliged to comply, within certain limits, with government directives, are subject to controls and in certain circumstances to commissioning by the government.

NATIONAL

The work of the Ministry of the Environment and Energy Security (MASE) is aimed at safeguarding land and water resources, terrestrial and marine ecosystems, endangered animal and plant species, the reclamation of areas and watercourses, the reduction of sources of pollution and climate-changing gas emissions, in the context of the global warming challenge. The Ministry ensures the safety of energy and geo-mineral infrastructures and systems, supply, efficiency and competitiveness, and the promotion of renewable energies. It promotes good practices and environmental education, the circular economy, sustainable mobility and urban regeneration; it supervises the national natural heritage on land and sea (national parks, protected marine areas, basin authorities, environmental consortia and regulation of large lakes).

The Regional Environmental Protection Agencies (ARPA) make up the National System for Environmental Protection (SNPA) and mainly exercise competence in the areas of water, environment and health, air, biodiversity, climate change, electromagnetic fields, ecological offences and environmental emergencies. This through the control of air, water, soil, acoustic and electromagnetic pollution sources and factors, monitoring of the various environmental components, control and supervision of compliance with the regulations in force and the prescriptions of the measures issued by the competent authorities in environmental matters, technical-scientific, instrumental and analytical support to the titular bodies with active planning and administration functions in the environmental field (Regions, Provinces and Municipalities), the development of an environmental information system supporting the institutional bodies and available to the social organisations concerned.

REGIONAL

Region governs, by its Departments, the protection and enhancement of the environment and the landscape, takes care of urban planning, the management and prevention of risks deriving from industrial activities, the governance of environmental aspects in compliance with good ecological legislative practices, the protection of biodiversity, protected areas and NAtura 2000 sites, also with a view to their establishment, also promoting

the realisation of the regional ecological network. Moreover, it takes care of regional policies concerning agriculture, animal husbandry, fishing, hunting activities and aquaculture, the protection of quality and health standards of agri-food production.

The Port System Authority (AdSP) is a public body with legal personality having, among its institutional aims, the management and organisation of goods and services in the respective port area with a strategic role of direction, planning and coordination of the system of ports in its area. In order to ensure consistency with the national strategy, a National Conference for the coordination of the AdSPs will be established. The Port System Authority of the Ionian Sea operates in the Port of Taranto.

Aqueducts are responsible for the collection, treatment and distribution of drinking water. The Apulian aqueduct is the public drinking water supply infrastructure of the Apulia region and some municipalities in Campania. It handles water distribution and supply, maintenance and sanitation of sewer networks, collection and treatment of urban wastewater (purification), and reuse of wastewater in agriculture, industries, and urban activities.

LOCAL

The Municipality is the local authority that represents its community, looks after its interests and promotes its development. Among other responsibilities, the municipality is responsible for all administrative functions affecting the population and the municipal territory, urban and building planning at the municipal level, as well as participation in supra-municipal spatial planning. In environmental protection, municipalities can contribute by managing the administrative, monitoring and local action aspects.

Provinces exercise various fundamental functions in the territory under their jurisdiction, also related to transportation and school organization; in particular, provincial territorial planning for coordination is their responsibility, and they cooperate with other entities for the protection and enhancement of the environment.

2.3.3.2 Target Groups for up-scaling in Italy

To successfully scale up the NBS validated in the RHE-MEDiation project across the national territory, the project engaged with key stakeholders who are pivotal in decision-making at local, regional, and national levels. In the context of Italy, actions to protect and improve environmental quality involve various government bodies and structures. This includes not only the Ministry of the Environment and Energy Security but also regional and municipal authorities, as well as other local administrative and technical-scientific bodies.

To this objective, we involved the Municipality of Taranto and the Province, in particular the Environmental sector, among the local government bodies; at the regional level we contacted ARPA Puglia and the Port Authority which are technical-scientific bodies, Department of Environment, Waste Cycle and Remediation, Environmental Supervision, Industrial Risk, Spatial Planning, Land Use, Landscape, Urban Planning, Housing Policy, Department of Agriculture, Agribusiness, Agribusiness Resources, Land Reform, Hunting and Fishing, Forestry and Department of Budget, Planning, Accounting, Finance, General Affairs, Infrastructure, State Property and Heritage, Soil Defense and Seismic Risk, Water Resources and Water Protection, Sports for All of the Regional government and, in an attempt to involve one of the largest bodies in charge of managing large purification plants, Acquedotto Pugliese SpA which operates for all the municipalities in Puglia and in numerous municipalities in Campania; at the national level, we contacted the Ministry of the Environment and Energy Security (Division V – Sustainable use of water resources) and ARPA Veneto and ARPA Campania

which, as technical-scientific bodies, could be interested in the technology, acting as facilitators for a possible future application also in sites similar to the Taranto demo-site in Italy (*Table 5*).

Once the target stakeholders had been identified, it was drafted a joint letter of presentation, in which, in addition to indicating the demonstration sites and the main objectives of the project, we asked for the possibility of a meeting, in person, by telephone and via webinar, in order to discuss the topic in greater depth. The letter, sent by e-mail and always preceded by telephone contacts, was associated with explanatory material, i.e. the project brochure and posters that had been produced relating to the general vision of the project, the technology of the plant and the supporting technologies, and the methods of involving stakeholders and the population. Associated with this material was a questionnaire, which people were asked to answer, relating both to the targets of 50% abatement of pollutants in marine waters set by the European community by 2030, and to the project they were asked to join, showing an interest in continuous updating on the results obtained in order to assess future possibilities for use in other high-impact geographical areas.

Because the particular time, being at the end of the year, there was no opportunity to have any meetings in person or via webinar, and all contacts were made by email and telephone.

Table 5 : Target groups and high-level stakeholder groups in Italy

High Level Stakeholder - Policy Makers	Whom to interview	Dates of engagements	Mode
NATIONAL			
Veneto ARPA (Hot Spot- Venice lagoon)	Department Director	1 – 12/12/2023	by email/phone
Campania Arpa (Hot Spot- Sarno river)	Department Director	4 – 12/12/2023	by email/phone
Ministry of the Environment and Energy Security (Division V – Sustainable use of water resources)	Head of the Division	30/11/2023– 7/12/2023	by phone
REGIONAL			
Apulia ARPA	Director of the department	30/11/2023– 7/12/2023	by phone
Port System Authority of the Ionian Sea	General secretary Head of the Environment Section	1 – 12/12/2023	by phone
LOCAL			
Taranto Municipality	- Mayer - Vice Mayer - Head of the Environment Depart.	30/11/2023– 7/12/2023	by phone
Provincial Planning and Environment Sector	- Head of the Environment sector	1 – 12/12/2023	by phone

It has also been communicated to other national, regional high-level stakeholders. These are at National level: Ministry of the Environment and Energy Security (Division V – Sustainable use of water resources); at Regional level: Apulian aqueduct (Responsible for the Research, Development and International Activities organizational unit), Department of Environment, Waste Cycle and Remediation, Environmental Supervision, Industrial Risk, Spatial Planning, Land Use, Landscape, Department of Agriculture, Agribusiness, Agribusiness Resources, Land Reform, Hunting and Fishing, Forestry, Department of Budget, Planning, Accounting, Finance, General Affairs, Infrastructure, State Property and Heritage, Soil Defense and Seismic Risk, Water Resources and Water Protection, Sports for All. There will be meetings and information exchange in the following months with these high-level stakeholders.

2.4 First Contact and Mode of Engagement

In order to be able to present the project's objectives and activities, and to involve the most representative and effective stakeholders, a common strategy was defined with the demo site partners in Greece, Türkiye and Italy leaving each one the possibility, depending on the timing and characteristics of each country, to make adjustments to achieve the common goal: the scale-up of the connection with the authorities and decision-makers of the Member State of the demo sites. In *Table 6*, the different modes of engagements used at each demo-site are summarized.

Table 6 : Mode of engagement in demo-sites

Engagement channel	How	Türkiye	Greece	Italy
Interview (in person)	in the first part provided synthesised information about the Mission and the Project.	×	×	×
Interview (virtual)	in the second part interview was held by asking the questions.	×	×	
Online survey	questionary		×	
Phone calls				×
E-mailing		×		x

After the initial introduction of the project to the stakeholders, whichever channel they prefer, (*Table 6*), the following questions were posed during the engagement. This is to understand the alignment and misalignment of measures recommended following the EU Mission and the Mission of RHE-MEDiation with national policies and priorities, as they pertain to HOTSPOTS in the national territory and beyond, and to gauge the commitment level of participants to support the project as national actors.

A. About the Mission

1. How is the EU Mission cascading to the national level and its alignment with existing national polices?
2. How important is the issue in your plan/priorities?
3. What is the major obstacle to reduce the impact of HOTSPOTS?
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)

B. About RHE-MEDiation

1. What are your thoughts on the action proposed by the RHE-MEDiation project?
2. Do you believe that this 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?
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?
5. Are you interested to collaborate with the project? (The different engagement options in the RHE-MEDiation project would be highlighted to the interviewee including the possibility of developing white papers together.)
6. If an advisory board is established, would you be willing to take an active role?

3 RESULTS OF THE ENGAGEMENT ACTIVITY

3.1 Türkiye

Meetings were held on the dates specified in the previous section (*Table 3*). In the first part of the meetings, after two presentations were given about the EU missions and the project, the institutions' questions were answered. In the second part of the meeting, the questions determined were asked to the representatives of the institutions and their answers were received. After that, they were asked to send their answers to the project team in writing. The following sections contain the answers and information given by each institution that was interviewed.

3.1.1 National High-Level Stakeholders

Two main national high-level stakeholders which are Ministry of Agriculture and Forestry (General Directorate of Water Management) and Ministry of Environment, Urbanization and Climate Change (General Directorate of Environmental Management and General Directorate of Environmental Impact Assessment, Permit and Inspection) were contacted. One in person and one virtual meeting was hold at the dates of given in *Table 3*. In both meetings, Head of the related departments, along with their experts, totalling 12 people, participated.

A. About THE EU MISSION

The Ministry of Agriculture and Forestry, along with the Ministry of Environment, Urbanization and Climate Change, are two major national actors in the field of environment and work in a complementary manner. Although information on the EU Missions is limited, it has been observed that the current plans made in Türkiye, within the framework of EU accession and the Green Deal, are compatible with the mission.

From an environmental perspective, legislation has set limits for chemical pollutants, fully aligning with the Water Framework Directive (WFD). The national Water Pollution Control Regulation, applicable to urban and industrial discharges, specifies limit values for certain key metals, varying by sector. However, in Türkiye, the current regulations do not comprehensively address chemical parameters. Consequently, there is no legal mandate for removing organic chemicals in urban and industrial treatment facilities, as discharge regulations are yet to be established. It is anticipated that the legislation will gradually enforce discharge limits based on the receiving water bodies by 2030. A critical challenge for Türkiye, however, is securing the necessary financial support for these initiatives.

B. About RHE-MEDiation

At the national level, the approval of the design of urban and industrial wastewater treatment plants is the responsibility of the Ministry of Environment, Urbanization and Climate Change. Surface waters that are sensitive to Nitrogen (N) and Phosphors (P) in terms of eutrophication have been defined by the Ministry of Agriculture and Forestry by regulation. Areas that are polluted and/or may be polluted by chemical substances in surface waters have not yet been determined at the national level. However, the locations and all information of urban and industrial wastewater treatment plants, which are one of the most important pressure factors in terms of chemical pollutants and the subject of the RHE-MEDiation project, are known at the national level. Although it is not considered very feasible to treat wastewater with algal bioreactors for large cities and wastewater with large number of flows, it has been seen that it is highly applicable in smaller scale and especially in decentralized places where there is no shortage of space.

3.1.2 Local High-Level Stakeholders

Four high-level stakeholders at the local level were visited and interviewed at the dates indicated in *Table 3*. They were;

- İstanbul Water and Sewerage Administration
- İstanbul-Ministry of Environment, Urbanization and Climate Change Provincial Directorate
- Kocaeli Metropolitan Municipality and Water and Sewerage Administration
- Kocaeli -Ministry of Environment, Urbanization and Climate Change Provincial Directorate

In all meetings, Heads of the related departments, along with their experts, totalling 24 people, participated.

A. About THE EU MISSION

Local authorities in Türkiye are not familiar with the European Union Missions. However, they are aware of the importance of chemical pollution in surface waters and seas for the local economy. For this reason, local institutions are carrying out many applications and projects to protect the regions under their responsibility from chemical pollution. Even if it is not mandatory under the regulations in force at the national level, they are carrying out monitoring studies and inspection, especially in areas under pressure, and if there is pollution in these points, they are carrying out improvement studies.

B. About RHE-MEDiation

Local authorities' perspective is very positive about RHE-MEDiation mission. They stated that RHE-MEDiation will provide a significant advantage in terms of energy if it is successful. However, the most limiting parameter in terms of treatment in especially big cities is the need for space.

3.2 Greece

The first High-level stakeholders RHE-MEDiation activity organized by EYDAP and HCMR was significant in relation to scaling up the stakeholders engagement in Greece. Engaging eleven HLS, including representatives from Administration authorities at national, regional, and local levels, along with Capital representatives from Water and Wastewater Utilities, demonstrates a comprehensive approach to involving key decision-makers and influencers in the project.

A "top-down" approach had the potential to ensure that HLS were engaged first, setting the tone and direction for the project's interaction with different administrative levels and utilities. Initiating this engagement process sets the groundwork for collaboration and alignment of strategies across various levels of governance and utility management.

3.2.1 National High-Level Stakeholders

Four (4) National HLS representatives from Departments of Ministry of Environment and Energy were contacted officially by email in order to establish "in person" meetings. More specifically, at National Level, invitations were sent to:

- Directorate General for Water
- General Director of Inspectors & Auditors
- General Director of Environmental Licensing
- General Director of Environmental Inspectors

Although the invitation was positively regarded, it was not set as priority by the Ministry of Environment and Energy. The Head of the Directorate General for Water was also informed but he was not available for an interview. Nevertheless, a peer-to-peer meeting with three (3) Environmental Inspectors took place on 27th November and the Head of Coordinating Office for Environmental Damage Response completed the RHE-MEDiation questionnaire through the survey mode.

A. About THE EU MISSION

The responses reflect a mix of optimism and challenges regarding the alignment of the EU Mission with national policies. While admitting limitations in the legal framework, there is acknowledgement of the framework potential for policy harmonization. Considering the importance of the issue as extremely high due to the challenges in addressing residual pollution. Obstacles primarily revolve around documentation, identifying responsibility, and reluctance to take appropriate measures. Concerns about legal and financial frameworks to support solutions arise, with interviewees indicating a lack thereof. Expectations for near-future improvements in EU efforts to reduce pollution are not optimistic based on current indications. The interviewees were unaware of EU Mission projects and their potential participation in them and highlight that due to country-specific conditions such as the existence of small islands and seasonal pressures the implementation of such projects in Greece could be significant and they could maximize the mission's impact.

B. About RHE-MEDiation

The responses indicate thoughtful optimism and a need for a comprehensive approach. It is supported that the action proposed by the RHE-MEDiation project could have a positive impact but the necessity for a comprehensive response is emphasized, combining technology and other measures for better results. The interviewees are unsure about the potential of the suggested technology and express their interest to collaborate in the framework of RHE-MEDiation. However, they are currently unable to provide specific recommendations. Additionally, their willingness to participate in an advisory board depends on the alignment of the council's objectives with their professional scope and responsibilities.

3.2.2 Regional High-Level Stakeholders

Two (2) Regional HLS were contacted, namely the Prefecture of Attica (PoA) and Prefecture of West Attica. The Head of the General Directorate of Sustainable Development and Climate Change (PoA) was informed about the RHE-MEDiation project. On 27th November a successful meeting and interview took place in members of the Prefecture of West Attica (near Thriasio Demo Case) with the presence of the Regional Vice Governor and the Head of the Environment Department whose website can be accessed in the following links [6][7].

The Regional Vice Governor showed particular interest in the project's objectives and proposed to organize a meeting with representatives from all the Heavy Industries in the vicinity of the Elefsis gulf in order to inform them about the RHE-MEDiation project.

The answers of the two members of the Prefecture of West Attica are summarized below:

A. About THE EU MISSION

Regional HLS emphasize the significance of the EU Mission at the national level, particularly through specific projects like biological purification and water control. They highlight the extreme importance of the Mission in their plans but they identify multiple obstacles such as lack of legislation, inadequate agency cooperation, high control costs, waste management difficulties, and the complexity of the activities of industries that require strict environmental regulations. Concerns are evident regarding the appropriate legal and financial

framework to support RHE-MEDiation solution implementation. While not expecting immediate improvements, they stress the need to communicate the pilot program results to influence European directives and national legislation regarding pollution. They express interest in understanding the pilot program outcomes across RHE-MEDiation hotspots and emphasize the need for the commitment of industries to sustainable development and the stricter implementation of legislative frameworks in Greece.

B. About RHE-MEDiation

Regional HLS believe that the RHE-MEDiation project will yield positive outcomes. They also advocate for additional upstream measures to complement the technology proposed by the project to address pollution in hotspots. Anticipating challenges in scaling up the cleaning process, they express uncertainties or lack of knowledge in this regard. When asked about collaboration, they express interest in contributing by assisting with the project objectives and results dissemination to local communities, attending informative meetings, and potentially participating in an advisory board, albeit with limited involvement due to time constraints.

3.2.3 Local High-Level Stakeholders

Four (4) Local HLS were contacted during November and December 2023 and five interviews were conducted through the survey:

- Thessaloniki Water Supply & Sewerage Company S.A.
- Municipality of Aspropyrgos
- Hellenic Association of Municipal Water and Sewerage Utilities
- Municipal Water Supply and Sewerage of three cities (Rethymno, Heraklion and Patras)

On 27th November 2023 a successful meeting and interview took place with the Head of Environment Department from Municipality of Aspropyrgos.

A. About THE EU MISSION

Overall, Local HLS interviewees showed a lack of knowledge regarding how the EU Mission aligns with national policies but they generally viewed it positively. They emphasized the importance of the issue of pollution, aligning with their goals. The major obstacles highlighted included cost, the complexity of pollution sources, and inadequate technology. While some interviewees mentioned partial legal frameworks, most felt inadequately supported by current frameworks and tools. There was thoughtful optimism regarding the EU's efforts to reduce pollution, with some expressing doubt. They showed interest in participating in Mission-funded projects, citing benefits in improving the environment and avoiding further pollution. Specific country conditions for maximizing the Mission's impact included enforcing compliance with laws by polluters, acknowledging the Mediterranean as a closed sea, data scarcity from wastewater treatment plants, and industrial waste disposal.

B. About RHE-MEDiation

Interviewees were positively inclined towards the significant impact of the RHE-MEDiation project and provided practical suggestions for improvement. They highlighted the need for additional measures, particularly concerning addressing emerging pollutants at their source, emphasizing a comprehensive approach for effective pollution control. Challenges foreseen during up scaling the RHE-MEDiation cleaning process included cost, space availability, and bioalgae management. Some respondents mentioned the importance of experienced personnel and the willingness of involved entities as crucial factors. There was a general interest in collaborating with the project, expressed through various suggestions for involvement, such as identifying application points for the project's action and participating in data sampling. Regarding

participation in an advisory board, respondents appeared generally interested but requested more information before committing to it.

3.3 Italy

The RHE-MEDiation activity organised by the CNR was significant in increasing stakeholder involvement in Italy, through contacts with representatives of administrative authorities at national, regional and local levels, together with representatives of technical and scientific bodies demonstrates a comprehensive approach to the involvement of key decision-makers and influencers in the project.

The initiation of this involvement process lays the foundation for collaboration and alignment of strategies between the various levels of government and utility management. At the local level, all the authorities involved have shown a high level of interest, declaring themselves willing to be involved as of now and asking to be kept up-to-date on the future achievement of results.

3.3.1 National High-Level Stakeholders

At the national level the technical-scientific authorities showed a high level of interest and willingness to be involved right from the start of the project, even participating in meetings and comparisons, while the political community judged their involvement too early, postponing the possibility of further contacts until later.

In a formal subscripted letter, the Director General of the Veneto Regional Agency for Environmental Prevention and Protection expressed his willingness to be involved as a stakeholder, expressing his interest in joining the "Stakeholder Reference Group" in order to be informed about the remediation actions proposed by the RHE-MEDiation project for validation and in-situ demonstration purposes and to receive subsequent information on their efficiency and the impacts of these changes on water quality. It is also available to support the co-design activity that will decide on the priorities of the remediation actions to be set up and of the monitoring activities, once the system is fully operational, within the limits of its competences and provided that the commitment is compatible with the agency's institutional activities, also in view of the resources that can be effectively deployed where available. It therefore expressed its willingness to help facilitate the sharing with decision-makers of the knowledge developed by the project on the water conditions and the effectiveness of potential remedial actions aimed at reducing anthropogenic pollution in contaminated areas of the country.

A. About THE EU MISSION

It was emphasized that, due to the vast dimensions of the pollution phenomenon, and being an issue that covers a geographically wide, global scope, it is unlikely for the EU to achieve such an ambitious target in such a short timeframe; the rules and regulations currently in force could be truly effective if the actions implemented by the institutions had a universal, sustainable application, aimed primarily at releases into the environment.

B. About RHE-MEDiation

Answers showed that the project could indeed be one of the possible actions useful for achieving the objective. In general, although there are many feasible actions, they are very often characterized by a modest overall effectiveness because they act individually; it would therefore be desirable to build a synergy between the various possible technologies and actions, also associated with actions such as specific bans on the marketing of products containing elements that are harmful to the environment, consumer information campaigns on specific products, research incentives for the design of substitute products, and sanctions

against imports of products that are not consistent with the policies for reducing chemicals in the sea. In this perspective, the role of stakeholders becomes fundamental, making the project viable and shareable.

3.3.2 Regional High-Level Stakeholders

At the regional level, technical and scientific authorities, such as Arpa and the Port System Authority of the Ionian Sea, have shown an obvious interest, even making themselves available to share their data in order to obtain a more global and effective vision of the technology, while the political community, although showing some interest and being open to future meetings, preferred to postpone their participation until the first experimental data were available.

A. About THE EU MISSION

While we are aware that the scale of the pollution phenomenon is extremely large and global, we have confidence in the EU's ability to achieve the target set, by working on the implementation of the regulations now in force, which, at present, show a short range of action, especially at local level, where greater synergy and planning capacity would certainly be more effective.

B. About RHE-MEDiation

The project was considered interesting and potentially capable of contributing to the resolution of the problem, but especially in synergy with processes for greater control of pollutant emissions and policy actions to reduce chemicals at sea. Believing that stakeholder participation was important for the achievement of not only the project's but the EU's objectives, technical and scientific bodies indicated their willingness to be involved.

3.3.3 Local High-Level Stakeholders

At the local level, both the City of Taranto and the Province shared the project's objectives and appreciated the request for involvement, making themselves available to be informed about the remediation actions and the efficiency of the technology to be tested. Due to the many activities to be carried out at this time of the year, however, they preferred not to allow much time and did not respond to the questionnaire, postponing further contact until 2024.

4 CONCLUSIONS

In the content of Task 1.3 actions put in place to liaise with local authorities and policy makers to attract their attention about the demo-site mission within own state mission strategy, thus, to maximise impact effects and related evaluation from local to national level.

The first conclusion is that each of the demo-case countries has different administrative structures. While decisions are made top-down in Türkiye and Greece, the approach in Italy is to involve entities at all levels. These different approaches of countries effect the strategy setting for scaling-up of the technologies.

The second conclusion is that even though the authorities have positive perspective of implementation of RHE-Mediation technologies, the most important triggering factor is having a strong legislation (s) for the chemical pollutants.

In Türkiye, EU directives are taken into account for the quality of the receiving water environment, while a limited number of parameters are taken into account for the discharge of treated wastewater. However, work is ongoing to create wastewater discharge limits based on the quality of the receiving water environment. The Ministry of Climate Change Environment and Urbanization aims to switch to receiving environment-based discharge limits in 2030. It can be concluded that the legislative situation for chemical parameters in water in Türkiye is evolving. While existing regulations cover a range of pollutants and set specific standards, challenges remain in enforcement, and ongoing adjustments are expected in line with EU directives and the evolving understanding of pollutants. It is a fact that the identification and implementation of discharge limits appropriate to water quality are important for reducing and preventing chemical pollution in receiving water bodies (river, sea). These limits can be defined as limits that industrial facilities, municipalities, and other organizations must comply with to improve the quality of their wastewater. Another important challenge for Türkiye is the high cost of environmental investments. These costs include the construction, operation, and maintenance of facilities to prevent or reduce chemical pollution. All the HLS has positive perspective and good interest for RHE-MEDiation solutions.

In Greece, RHE-MEDiation has already received positive comments from HLS as indicated in their answers provided in the previous sections of this deliverable. The alignment of the EU Mission with national policies was acknowledged at the national level despite identified shortcomings, while specificities at regional and local levels remained unclear. The issue of pollution was uniformly deemed as very to extremely important at national, regional, and local levels due to the challenges and costly nature of residual pollution. Identified obstacles to reducing hotspot impact varied widely, encompassing documentation challenges, legislative issues, costs, industrial activities, and multiple pollutants. The country lacks appropriate legal and financial frameworks for implementing solutions, as noted across the board. Expectations for improvement from EU efforts showed a wide range of responses from negative to positive, differing across administration levels. At the national level, there was a lack of knowledge about the Mission, while at the regional and local levels, there was a positive inclination to participate in funded projects. Specific country conditions in Greece, such as small islands, seasonality, lack of sustainable development will, compliance issues, and data gaps, were identified as factors with the potential to maximize the Mission's impact.

Considering the RHE-MEDiation project, there was consensus on the necessity for a comprehensive approach combining technology and various measures to mitigate pollution in hotspots. Challenges in up scaling RHE-MEDiation included a lack of detailed knowledge about the technology as well as concerns about costs, space requirements, waste management, and personnel involvement. Interest in collaboration was expressed across all levels, contingent upon more detailed information and specific collaboration options being

provided. Overall, there was an expressed interest in participating in an advisory board, with considerations about the workload and alignment with the scope.

In Italy, RHE-MEDiation has been positively received by HLSs, particularly the scientific-technical bodies. The issue of pollution is considered to be a very serious and global problem, and the legislation and regulations currently in place could be truly effective if the actions put in place by institutions had universal and sustainable application, aimed primarily at emissions to the environment. The project was considered among the possible actions useful for achieving the goal, but if understood in synergy with other possible technologies and actions, including those to improve the regulations currently in force, also associating information campaigns aimed at the population and greater availability of research funding.

At the conclusion of this first series of contacts, a continuous flow of information, including under exchange conditions, is planned among the technical and scientific bodies involved, and, once the first experimental results have been obtained, also meetings with regional and national governmental bodies.

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ANNEX A : TURKISH HLS INTERVIEWS

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
General Directorate of Water Management- Ministry of Agriculture and Forestry (MoAF)	NATIONAL	A Written replay	Türkiye

A. About EU Mission

1. How is the EU Mission cascading to the national level and its alignment with existing national polices?

As Türkiye entered the European Union (EU) accession process in 2005, a number of important reforms also became necessary. One of these requirements is the harmonization of national legislation with EU legislation. In this context, one of the closing criteria considered in the negotiations carried out within the framework of the 27th Chapter, "Environment and Climate Change" of the EU negotiations, is the harmonization and implementation of the EU Water Framework Directive (WFD). In Türkiye, it is aimed to achieve the harmonization of the WFD and complementary directives with EU legislation, to eliminate conflicts in the field of water management, to ensure effective coordination, and to provide principles for the more efficient use of public resources through the enactment of the "Water Law Draft" which is currently under development. The most effective and important step taken in the context of the adaptation of the WFD in Türkiye in legal and administrative terms is the establishment of the General Directorate of Water Management in 2011. In fact, within the scope of the WFD (2000/60/EC), which is based on EU studies, the national coordination of the "Water Quality Sector" is carried out by the General Directorate of Water Management.

The WFD foresees River Basin Management Planning as a method to achieve its basic goal of good water status. Within the scope of River Basin Management Plans, a program of measures is being developed to determine the current status of all water bodies within the boundaries of the basin, to prevent deterioration in water bodies in good and very good condition, and to bring water bodies in medium, weak, and poor condition to good condition. In this context, studies are continuing to effectively use the monitoring networks established in accordance with the requirements of the Directive in order to correctly determine the water status of the basins, to determine whether the basic goal of the Directive, good water status, has been achieved, and to determine the effectiveness of the measures taken to achieve good status.

On the other hand, in line with the 8th European Union Environment Action Program (2021-2030), which supports the environmental and climate action targets set out by the European Green Deal (EGD), and focuses on climate and sustainability issues such as biodiversity loss, climate change, resource use, and pollution, the processes related to the "Water Quality Sector" are being reviewed by the General Directorate of Water Management. In this context, studies are being carried out on the integration of the "Water Quality Sector" of the EU Environment and Climate Change Chapter with other chapters. In addition, the national process is being supported through actions developed under the EGD, which forms the basis of EU work to achieve the Sustainable Development Goals of the United Nations, under the headings of "green and circular economy" and "combating climate change".

In the light of this information, it is also possible to say that the EU Missions, which aim to bring concrete solutions by 2030, are spreading to the national level and that the EU Missions are compatible with the current national policies.

2. How important is the issue in your plan/priorities?

Three project studies that investigated the potential for the presence of urban, industrial, and agricultural chemicals in inland and coastal waters were carried out in pilot areas selected to reflect all of Türkiye between 2011 and 2014. The results of these studies were used to develop environmental quality standards for hazardous substances specific to our country. These standards were incorporated into the Surface Water Quality Regulation (YSKY), which was published in the Official Gazette on November 30, 2012, numbered 28483, and came into force in 2016.

Under the basin monitoring programs prepared by the General Directorate of Water Management (SYGM), monitoring studies are carried out by the General Directorate of State Hydraulic Works (DSİ) and its regional directorates in terms of the parameters included in the YSKY. The analysis results obtained are evaluated by our General Directorate and the water quality statuses are revealed, and national/international (Environmental Indicators Booklet, UNEP, etc.) reporting is carried out.

One of the duties of the SYGM is to "prepare river basin management plans" at the basin level in order to protect and develop the ecological and chemical quality of the aquatic environment, taking into account the protection-use balance of water resources, including coastal waters, and to carry out legislative work on comprehensive river basin management."

The main issues related to the monitoring of water quality and quantity within the scope of the Water Framework Directive (WFD) are defined in Article 8 and Annex 5, and the Regulation on the Monitoring of Surface Waters and Groundwaters, which was published in the Official Gazette on 11.02.2014 numbered 28910, has come into force within the scope of the harmonization of the WFD with the legislation of our country. Thus, the legislative compliance of our country in terms of monitoring has been ensured. As required by this legislation, basin monitoring programs have been prepared for our 25 basins, including monitoring points, physicochemical and chemical monitoring parameters, biological and hydromorphological quality elements, and monitoring frequencies, taking into account the water bodies and typologies located in our country.

In this context, water quality monitoring studies are carried out within the scope of basin-based monitoring programs. As of 2024, within the scope of the Project for the Monitoring of Water Quality at the Basin Level, the Work of Monitoring the Water Quality and Preparation of the River Basin Management Plan in the Seyhan Basin, chemical, biological, hydromorphological monitoring and field studies will be carried out at the monitoring points of Seyhan Basin, including observational, operational and protected areas, in order to determine the current status of the water bodies in the Seyhan Basin, and the "Seyhan Basin River Basin Management Plan" will be prepared. Subsequently, it is planned to carry out monitoring studies to determine the water quantity and quality simultaneously in 25 basins.

3. What is the major obstacle to reduce the impact of hot spots?

River basin management plans (RBMPs) are documents prepared to protect and improve the quality of water resources in a basin. These plans aim to identify point and diffuse source pressures in the basin, identify measures to improve water quality, and ensure the implementation of these measures.

One of the most important challenges faced in the implementation of RBMPs is the high cost of environmental investments. These costs include the construction, operation, and maintenance of facilities to prevent or reduce pollution. For example, the construction and operation of facilities required to treat wastewater from an industrial facility requires a significant cost.

On the other hand, the identification and implementation of discharge limits appropriate to water quality are important for reducing and preventing chemical pollution. These limits can be defined as

limits that industrial facilities, municipalities, and other organizations must comply with to improve the quality of their wastewater.
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?
The Water Quality Regulation (YSKY) includes provisions that require the use of environmental quality standards in the receiving environment to prevent point and diffuse source pollutants from polluting water resources. These provisions are found in Article 5(1)(c), titled "Principles and Basics," and Article 6, titled "Protection of Receiving Water Environments."
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?
Not answered
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)
Not answered
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)
Globally, we are facing a highly destructive climate crisis. Drought is now a disaster on par with earthquakes and floods in the world. Türkiye is located in the Mediterranean basin, which is one of the most vulnerable regions to the negative effects of climate change. The effects of climate change are being felt with all their severity with forest fires, floods, floods and ecosystem losses. In Türkiye, dry years have been experienced in the last 10 years, and the severity and duration of droughts have also begun to increase. According to climate change forecasts in our country, an increase in temperatures, a decrease in precipitation and total snow cover are expected in the next 26 years. In the 2023 water year that ended in October, precipitation decreased by 6% compared to the long-term average. In calculations made by taking into account the water potential of our country, the annual amount of water per capita is determined as 1,313 cubic meters. This value shows that our country is under water stress according to international indicators. It is estimated that this rate will fall below 1,000 cubic meters in 2030 and Türkiye will enter the category of water-scarce countries. According to projections; It is expected that our population will increase by 10% and our water potential will decrease by 20% in 2030. On the other hand, the Loss and Damage Fund, which has been on the agenda for a long time, was adopted on the first day of COP28. With the adoption of the said Fund, especially climate-vulnerable and developing countries will be able to receive financial support for disasters such as floods, floods, forest fires and desertification caused by climate change. Indeed, Türkiye is experiencing a 1.5 degree scenario compared to the pre-industrial period in the Mediterranean basin, which is also included in the IPCC report of our country. In addition, in the light of scientific data, this new fund regulation, which prioritizes the needs of our country and developing countries and aims to serve climate justice, should be made operational in a fair understanding that our country is not left behind. In the light of this information, it is considered important to emphasize the importance of the EU's technical and financial support to reduce this vulnerability to the least extent possible, and not to ignore the sensitivity of our country in terms of the impact of climate change on water resources and adaptation activities.
B. About RHE-MEDiation
1. What are your thoughts on the action proposed by the RHE-MEDiation project?
In terms of the sustainable solution of the pollution problem with biological approaches, the solutions proposed by the RHE-MEDiation project will lead the way in these studies.

2. Do you believe that this 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?
The approach of starting with pilot applications locally and then scaling up from local to national level is considered to be the right approach to solving the problem in terms of the RHE-MEDiation project objectives.
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?
The first step is to take basin-based measures by controlling point and diffuse pollution sources entering the water source. Afterwards, a model study should be carried out to reveal all measures, an evaluation should be made, and improvement measures should be implemented by decision. As an innovative approach, floating wetlands, which are not yet available in our country, are emerging as a very effective method for nutrient and heavy metal removal from the water column with low energy consumption and low cost, provided that they are properly established taking into account the conditions.
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?
The efficiency of pollution removal in a different water environment may vary, as the types of algae that can live under optimum conditions may vary depending on the changing environmental conditions. On the other hand, the data obtained from the average of repeated study results from small-scale studies may be sufficient to provide a database that reflects large-scale studies. In addition, the data obtained in the mentioned project can also be the basis for projects aimed at implementation on a larger scale and with different structures (such as salinity, pollution load, flow regime differences, etc.).
5. Are you interested to collaborate with the project?
Yes, we are interested in collaborate with RHE-MEDiation.

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
General Directorate of Environmental Management / General Directorate of Environmental Impact Assessment, Permit and Inspection- Ministry of Environment, Urbanization and Climate Change (MoEUCC)	NATIONAL	Interview notes	Türkiye

Currently, many studies are being carried out on the harmonization of European Union (EU) legislation with Turkish legislation. Türkiye has achieved many legislative and institutional developments in terms of water management.

MoEUCC has been conducting pollution and quality monitoring studies in the Mediterranean Sea and the Aegean Sea- since the 2000s under the Barcelona Conventions signed by Türkiye and national and international legislation. Since 2011, the marine monitoring studies have been carried out on the basis of ecosystem-based management approach under the "Integrated Marine Pollution Monitoring Program". Through the monitoring program, it is aimed to establish a scientific background for the determination of national marine and coastal management policies and strategies for the Turkish seas; where comprehensive assessment reports are prepared about the findings based on the historical and up-to-date data. In the framework of the monitoring program; the physicochemical properties of the water column, ecological status indicators, state of pollution, radioactivity levels, marine litter accumulated at the coasts and the seas, the seafloor and water column biodiversity/habitats, contaminant levels in the target species of economic value are monitored. With these results, quality classifications have been made for assessing the status of coastal water bodies and marine areas. Also, multi-variable data sets have been created to determine and follow up the definitions and targets of "good environmental status" for our seas. The monitoring activities consist of the following components:

- Monitoring of biodiversity and ecological quality (including alien species),
- Monitoring of eutrophication,
- Monitoring of pollutant levels and their trends as well as in terms of human consumption,
- Monitoring of marine litter in sediments, water and at the coasts.

MoEUCC monitors wastewater treatment plants in real time and collects and evaluates the data at the Continuous Monitoring Center (SİM). The following parameters are monitored 24/7 at the plants: pH, conductivity, temperature, dissolved oxygen, flow, chemical oxygen demand (COD), and total suspended solids (TSS). These data serve as a decision-support system, allowing for the analysis of plants on a sectoral basis and providing data for the guidance of the SKKY Sector Tables. The system is also able to take samples in alarm situations, thus developing a remote and effective monitoring mechanism for wastewater treatment plants.

"Domestic and Industrial Pollution Monitoring Program (EKİP)" has been conducting monitoring studies in the Küçük Menderes, Gediz, Northern Aegean, Basins since 2014. The program aims to provide data for the identification of hot spots and the taking of necessary measures to prevent

pollution at the basin level by conducting water monitoring studies in the receiving environment in basins under the pressure of intensive domestic and industrial pollutants. EKİP data is used by the relevant units of the Ministry of Environment, Urbanization and Climate Change, especially in basin action plans or projects aimed at pollution prevention, and in legislation studies to direct basin-based limits.

The Integrated Pollution Prevention and Control Directive (IPPC) (2008/1/EC) refers to an integrated approach developed to minimize pollution from a variety of industrial sources. The Directive includes an integrated environmental permit system that takes into account the entire environmental performance of industrial and agricultural activities with high pollution potential, including emissions to air, water and soil, waste generation, raw material use, energy efficiency, noise, accident prevention, and site remediation in the event of the termination of the operation. The IPPC Directive is included in the 1st and 2nd Chapters of the Industrial Emissions Directive (IED) (2010/75/EU), following a revision in 2010.

The Ministry of Environment, Urbanization and Climate Change (MoEUCC) carried out the "Project for Determination of Türkiye's Industrial Emission Strategy within the Scope of Integrated Pollution Prevention and Control (DIES)" between 2020 and 2023. This project aimed to guide the implementation of the IPPC approach in Türkiye, potentially leading to stricter controls on industrial emissions, including chemical pollutants in wastewater. The project resulted in the preparation of a National Action Plan that provides guidance for the implementation of the IPPC approach in Türkiye, and the development of technical capacity and infrastructure for the implementation of the IPPC approach. Prior to this project, projects were carried out for basic sectors such as the metal sector (2018-2020), the cement sector (2015-2017), the automotive sector (2015-2016), large combustion plants (2014-2016), and the textile and leather sector (2019-2020). MET control lists were prepared for these sectors.

In the coming period, the MoEUCC plans to implement the IPPC regulations in the sectors by publishing them. In this context, it is planned to achieve an improvement in the quality of receiving water environments. It is expected that positive effects will be observed with the monitoring studies carried out in the receiving environment. Depending on the results of these studies in 2030, Türkiye plans to shift to a system where discharge limits are set based on the specific receiving water body and its capacity to assimilate pollutants. This could lead to greater localization and potentially stricter water quality standards.

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
Istanbul Provincial Directorate of Environment, Urbanization and Climate Change	LOCAL	A Written replay	Türkiye

The Istanbul Provincial Directorate of Environment, Urbanization and Climate Change has a basic policy of protecting the environment and creating high-quality living spaces within the framework of sustainable development principles. It also aims to monitor and supervise the implementation of management plans for settlement, environment, and urbanization, continuously improve its effectiveness by complying with the requirements of the quality management system standard, and increase the satisfaction of service recipients by meeting their expectations and needs in accordance with legal requirements. Its vision is to establish liveable cities with a sustainable environment, and its mission is to regulate, supervise, participate, and focus on solutions in relation to planning, construction, transformation, and environmental management.

In Istanbul province, there are many urban wastewater treatment plants established/operated by the İSKİ General Directorate. The parameters measured in the SAİS cabins in the plants (flow, COD, TSS, pH, conductivity, dissolved oxygen, temperature) are recorded in real time and can be monitored from the Continuous Monitoring Center (sim.csb.gov.tr) established by the Laboratory, Measurement and Monitoring Directorate of the General Directorate of Environmental Impact Assessment, Permit and Inspection. The drinking water problem of the city has been solved with the drinking water networks and transmission lines, drinking water treatment plants, dams, and regulators built in Istanbul. Works are ongoing to convert the existing primary treatment plants into biological/advanced biological wastewater treatment plants.

Water is very important in terms of its role in the healthy continuation of life. However, the water resources of our country are becoming polluted day by day, and the amount of water per capita is rapidly increasing year by year with the increase in population. Türkiye has had legislation that can serve to protect the environment since the 1980s. This legislation moves in parallel with the world economy and politics, and develops within a framework.

It is believed that the proposed technology has the potential to solve problems in water polluted with chemical substances. With the RHE-MEDiation project; It is understood that it will provide an advantage to the existing facilities in our country, since it is a method that has not been applied before, and when the advantages and disadvantages of this method are compared. At the end of the project, it will shed light on scientists working on this issue. Potential challenges predicted during the real-scale applications of the technologies proposed by RHE-MEDiaition in our country; First of all, there may be a shortage of space. The plant must be built in the right areas with sunlight. When the method applied in the project is achieved, it will be offered as an alternative solution to similar problem-ridden facilities.

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
Istanbul Water and Sewerage Administration	LOCAL	A Written replay	Türkiye
A. About EU Mission			
1. How is the EU Mission cascading to the national level and its alignment with existing national polices?			
In Türkiye, Water and Sewerage Administrations (WSAs) are informed about these projects through the Scientific and Technological Research Council of Türkiye (TUBITAK).			
2. How important is the issue in your plan/priorities?			
Chemical pollution in our inland waters and seas is especially important for the regional economy. Our institution, as the largest WSA in the region, is also sensitive to this issue and is making efforts to prevent pollution by operating its treatment plants 24/7.			
3. What is the major obstacle to reduce the impact of hot spots?			
Wastewater discharge from industrial facilities to the collection system is monitored by our institution through on-site sampling at our accredited laboratories and laboratories located at our wastewater treatment plants where the wastewater is concentrated. Our institution initiated marine water pollution monitoring research with Istanbul University in 1996 to track the effects of the treated waters we discharge into the sea. These studies continued with TÜBİTAK in 2015, and currently, the Project of Monitoring Water/Sediment Quality in the Sea and the Golden Horn and Monitoring Biodiversity in the Golden Horn and Visualizing Deep Sea Discharge Lines is being carried out with TÜBİTAK MAM. The purpose here is to determine the effects of treatment, which is not mandatory by law, on reducing marine pollution. Although pollutants in domestic wastewater content are successfully treated by biological treatment methods, the high cost of treatment for components that come from industry and cannot be treated by biological treatment methods is a challenge. Chemical pollution producers do not want to bear the treatment costs.			
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?			
The following measures should be taken to prevent chemical pollution in the Marmara Sea and other sensitive areas: • There should be no underground industries around sensitive areas such as the Marmara Sea. • Industrial zones (OIZs) should establish and operate industrial wastewater treatment plants to treat chemical pollution. • Legislation should be developed to prevent chemical wastewater-related industries from being located in the collection basins of urban wastewater treatment plants that discharge into sensitive areas. • Necessary financial support should be provided for this to happen.			
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?			
This awareness is very important.			
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)			

We consider using the technologies that will provide more effective or economical treatment, as revealed by the results of mission projects.
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)
The factors such as the low gross national income per capita compared to Europe, the industries located in a scattered manner in the cities and the difficulties of supervision, intensive urbanization, and the uncertainty of the absorption capacities of the receiving environments should be taken into account. These factors are important to consider when developing policies to reduce chemical pollution in Türkiye.
B. About RHE-MEDiation
1. What are your thoughts on the action proposed by the RHE-MEDiation project?
The project, which aims to treat wastewater by algae production, which is thought to make significant contributions in terms of micro-pollutant removal, will provide a significant advantage in terms of energy if it is successful. However, the most limiting parameter in terms of treatment in our province is the need for space. The method planned to be implemented does not seem to offer an advantage in this regard or needs to be developed in this area.
2. Do you believe that this 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?
We need preliminary research results on this issue.
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?
The main goal should be to eliminate it at the source. In this regard, more effective use methods should be applied, considering that the excess of agricultural drugs will go to the sea. Conventional chemical treatment methods, MBR+activated carbon or ozonation can be applied in the treatment section.
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?
We are concerned that the area requirement is higher in RHE-MEDiation technology and that it will be affected by the decrease in air temperature and solar radiation, especially.
5. Are you interested to collaborate with the project?
We believe that we can contribute to the project at certain stages of the project, especially in the development of monitoring methods.

ANNEX B: GREECE HLS INTERVIEWS

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
The answer of Head of Environmental Damages, Hellenic Ministry of Environment and Energy	NATIONAL	Interview	Greece
A About EU Mission			
1. How is the EU Mission cascading to the national level and its alignment with existing national polices?			
"Despite any imperfections, the legal framework for harmonizing policies exists."			
2. How important is the issue in your plan/priorities?			
"Extremely important because residual pollution is more difficult and costly to restore."			
3. What is the major obstacle to reduce the impact of hot spots?			
"The full documentation of the pollution and the causes that caused it, the identification of those responsible, the reluctance-'refusal to take the appropriate measures."			
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?			
"No"			
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?			
"We have no indication so far in this direction."			
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)			
"I have no knowledge of the EU Mission project you mention."			
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)			
"Existence of many small islands, seasonality of activities/pressures."			
B About RHE-MEDiation			
1. What are your thoughts on the action proposed by the RHE-MEDiation project?			
"I believe it will have a positive impact."			
2. Do you believe that this 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?			
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?			
"I believe that there should be as comprehensive a response as possible and the combination of technology and measures can bring better results."			
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?			
"I do not know this technology in depth to have an opinion on the matter."			
5. Are you interested to collaborate with the project?			
"At this stage I cannot recommend anything specific."			
6. If/when an advisory board is established, would you be willing to take an active role?			
"Yes, as long as the objectives of the Council are consistent with the scope of my work."			

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
The answers of two members of the Prefecture of West Attica	REGIONAL	Interview	Greece
A. About the EU Mission			
1. How is the EU Mission cascading to the national level and its alignment with existing national polices?			
"It is through specific projects, such as biological purification and water control."			
2. How important is the issue in your plan/priorities?			
"Extremely important."			
3. What is the major obstacle to reduce the impact of hot spots?			
• "Legislation, Cooperation of Agencies, Cost of Controls, Management of new waste." • "The activity of industries that should be controlled and operate under very strict environmental conditions."			
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?			
"I do not know"			
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?			
"Not in the near future. The results of the pilot programs should be communicated, incorporated into European directives and national legislation to bring about changes to reduce pollution."			
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)			
"It would be useful to let us know the results of the pilot in Greece but also in Italy and Turkiye (due to different hotspots) with a simultaneous evaluation of the results."			
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)			
• "There is no will of the companies for sustainable development due to cost and lack of information." • "yes, I think that Greece suffers from deficits in the implementation of the legislative frameworks."			
B. About RHE-MEDiation			
1. What are your thoughts on the action proposed by the RHE-MEDiation project?			
"I believe it will have a positive impact."			
2. Do you believe that this 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?			
"Additional upstream measures."			
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?			
"I do not know."			
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?			
• "We could discuss it; I could help in the field of communicating the project to the local communities." • "Yes, by attending informational meetings"			
5. Are you interested to collaborate with the project?			
"Yes, but with limited role due to lack of time."			

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
1. Thessaloniki Water Supply & Sewerage Company S.A. (two answers) 2. Municipality of Aspropyrgos 3. Hellenic Association of Municipal Water and Sewerage Utilities 4. Municipal Water Supply and Sewerage of Rethymno	LOCAL	Interview similar answers appear once despite the number of people who provided them.	Greece
A. About the EU Mission			
1. How is the EU Mission cascading to the national level and its alignment with existing national polices?			
Overall, the responders expressed Lack of Knowledge of the MISSION alignment to National Level Their specific answers were : • "I do not know the national policies. The MISSION appears positive" • "There is no harmonisation" • "Do not know"			
2. How important is the issue in your plan/priorities?			
Overall, the respondees regarded the issue as Very Important. Their specific answers were: • "Very important" • "Our next priority goal is the reduction of this pollution, similar to the goal of the MISSION"			
3. What is the major obstacle to reduce the impact of hot spots?			
The respondees highlighted the issues of Cost and Multiple pollutants; However other obstacles were mentioned too: • "In my area, the industrial waste and pollution of streams and naturally of the sea" • "The cost" • "Overflowing sewage networks and the inability of treatment for pharmaceuticals and PFAS" • "The fact that usually pollution is due to a multitude of causes/pollutants and it is often difficult to isolate and assess the gravity of each one. • "the cost of implementing the projects, the spectrum and technologies for reducing this type of pollution, as well as the point of application			
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?			
The respondees provided a negative answer: • " No answer" • "partially" • "Regarding the legal framework yes, regarding the tools not always" • "Not yet, under development"			
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?			
Overall, the respondees had a positive feeling with some reservations. Their specific answers were: • "I am optimistic but with caution" • "I hope so" • "Yes" • "We hope that there will be a reduction, but it is somewhat doubtful when this will take place"			
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)			

Overall, the respondees had a positive reaction as follows:

- "Any attempt to improve the environment would be of interest to the municipality"
- "Of course, To avoid further pollution of the sea"
- "Probably"
- "don't know how, but I'd be interested to know"
- "There is always an interest in participating in funded projects with the approval of the management"

7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)

According to the respondees specific country conditions DO exist as:

- "Compliance to the law by polluters, because control by the competent authorities is not enough"
- "Perhaps take into account that the Mediterranean is a closed sea"
- "I do not know"
- "Lack of data (e.g. from the operation of Wastewater Treatment Plants or the disposal of waste from industrial units)"

B About RHE-MEDiation

1. What are your thoughts on the action proposed by the RHE-MEDiation project?

Overall, the respondees were favorably inclined on the positive impact and provided useful suggestions, such as:

- "if the actions are successful, they must be implemented and extended"
- "It is a very promising program"
- "Emphasis should be given mainly to pharmaceutical substances, PFAS should be contained at the source"
- "I believe that additional measures (mainly pollution prevention by controlling emerging pollutants at source) should definitely be incorporated"
- "As a first reaction, some additional wastewater "treatment" works may be needed before their release"

2. Do you believe that this 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?

3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?

The respondees provided a number of useful additional measures:

- "The more technologies, the better the results"
- "A more integrated approach to address pollution in the wider environment may be required"
- "Maximize source containment measures"
- "I believe that additional measures (mainly pollution prevention by controlling emerging pollutants at source) should definitely be incorporated"
- "As a first reaction, some additional wastewater "treatment" may be needed before their release"

4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?

The main challenges were identified as the cost, availability of space and management of bioalgae. Interesting remark were the availability of experienced personnel and the willingness of the entities involved. Their answers were:

- "the magnitude of the pollution load and the management of the resulting waste"
- "Increased cost, installation space of the bio algae panels and most importantly management of the waste bio algae without polluting another recipient area"
- "I don't know".

• "Finding sufficient space for the application of the technology and the disposal of the microalgae (e.g. in the case of its toxicity after the treatment of pollutants)" • "The cost of implementation, the available experienced personnel, the willingness of the entities involved"
5. Are you interested to collaborate with the project?
Overall, the respondees appeared interest to collaborate. Their statements: • "I am interested in your service and one way of collaboration is the identification other points to apply the action" • "Yes, we are interested. In the first phase we should know the composition of the "eternal chemicals" of the outflow " • "Not interested" • "Yes. Possible involvement in the simultaneous sampling of inflow/outflow from WWTP and seawater" • "There is strong interest in participation and at our next meeting and further familiarization with the subject, a more active participation can be discussed".

COMBINED ANSWERS OF HIGH-LEVEL GREEK STAKEHOLDERS

Name of the Stakeholder?	Level	Mood of engagement this primary data was collected with?	Location
All	NATIONAL	Interview	Greece
	REGIONAL		
	LOCAL		
A. About the EU Mission			
1. How is the EU Mission cascading to the national level and its alignment with existing national polices?			
"Despite any imperfections, the legal framework for harmonizing policies exists."			
"It is through specific projects, such as biological purification and water control."			
"Lack of Knowledge of the MISSION alignment to National Level"			
Overall: Varied answers			
2. How important is the issue in your plan/priorities?			
"Extremely important because residual pollution is more difficult and costly to restore."			
"Extremely important."			
"Extremely important."			
Overall: Very important			
3. What is the major obstacle to reduce the impact of hot spots?			
"The full documentation of the pollution and the causes that caused it, the identification of those responsible, the reluctance-'refusal to take the appropriate measures."			
• "Legislation, Cooperation of Agencies, Cost of Controls, Management of new waste." • "The activity of industries that should be controlled and operate under very strict environmental conditions."			
Cost and Multiple pollutants • "In my area, the industrial waste and pollution of streams and naturally of the sea" • "The cost" • "overflowing sewage networks and the inability of treatment for pharmaceuticals and PFAS" • "The fact that usually pollution is due to a multitude of causes/pollutants and it is often difficult to isolate and assess the gravity of each one. • "the cost of implementing the projects, the spectrum and technologies for reducing this type of pollution, as well as the point of application			
Overall: a variety of converging answers			
4. Do you have the appropriate legal and financial framework/tools to support the implementation of the solution or any solution in such a way to achieve your goals?			
Overall: negative answer			
5. Do you expect some improvement in the near future with the efforts EU makes to reduce pollution on our seas?			
"Despite any imperfections, the legal framework for harmonizing policies exists."			
"It is through specific projects, such as biological purification and water control."			
"Lack of Knowledge of the MISSION alignment to National Level"			
Overall: Varied answers			
6. How can the MISSION assist you? Can you consider participating in MISSION funded projects? (For local/state level authorities only)			
"I have no knowledge of the EU Mission project you mention."			

"It would be useful to let us know the results of the pilot in Greece but also in Italy and Turkiye (due to different checkpoints) with a simultaneous evaluation of the results."
positive reaction • "Any attempt to improve the environment would be of interest to the municipality" • "Of course, To avoid further pollution of the sea" • "Probably" • "don't know how, but I'd be interested to know" • "There is always an interest in participating in funded projects" with the approval of the management
Overall: a variety of diverging answers towards a positive answerwith the EXCEPTION of the negative National SH responce
7. Specific country Conditions that need to be shared with EU to maximize the impact of the mission? (Only for policy makers)
"Existance of many small islandsy, seasonality of activities/pressures."
• "There is no will of the companies for sustainable development due to cost and lack of information." • "yes, I think that Greece suffers from deficits in the implementation of the legislative frameworks."
specific country conditions DO exist as: • "Compliance to the law by polluters, because control by the competent authorities is not enough" • "Perhaps take into account that the Mediterranean is a closed sea" • "I do not know" • "Lack of data (e.g. from the operation of Wastewater Treatment Plants or the disposal of waste from industrial units)"
Overall: specific country conditions DO exist
B About RHE-MEDiation
1. What are your thoughts on the action proposed by the RHE-MEDiation project?
"I believe it will have a positive impact."
"I believe it will have a positive impact."
"Favourably inclined on the positive impact"
Overall: positive impact of the project
2. Do you believe that this 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?
3. Can you envision any other viable solutions for addressing water quality pollution in the HOTSPOTs aside from the one recommended by RHE-MEDiation project?
"I believe that there should be as comprehensive a response as possible and the combination of technology and measures can bring better results."
"Additional upstream measures."
The respondees provided a number of useful additional measures: • "The more technologies, the better the results" • "A more integrated approach to address pollution in the wider environment may be required" • "Maximize source containment measures" • "I believe that additional measures (mainly pollution prevention by controlling emerging pollutants at source) should definitely be incorporated" • " As a first reaction, some additional wastewater "treatment" may be needed before their release"
Overall: a variety of converging interesting suggestions
4. What are the potential challenges you foresee during scaling up of the RHE-MEDiation cleaning process in your country or other states in the Mediterranean basin?
"I do not know this technology in depth to have an opinion on the matter."
"I do not know."

- The main challenges were identified as the cost, availability of space and management of bioalgae.
- Interesting remark were the availability of experienced personnel and the willingness of the entities involved.

Their answers were:

- "the magnitude of the pollution load and the management of the resulting waste"
- "Increased cost, installation space of the bioalgae panels and most importantly management of the waste bioalgae without polluting another recipient area"
- "I don't know" EDEYA
- " finding sufficient space for the application of the technology and the disposal of the microalgae (e.g. in the case of its toxicity after the treatment of pollutants)"
- "The cost of implementation, the available experienced personnel, the willingness of the entities involved"

Overall: Only the local SHs spotted a number of challenges (the rest did not know)

5. Are you interested to collaborate with the project? (The options under collaboration Should be discussed by presented by the project. i.e., the other mode of engagements + writing white papers together).

"At this stage I cannot recommend anything specific."

"We could discuss it, I could help in the field of communicating the project to the local communities."

interest to collaborate

Overall: SHs would like to collaborate but needed more information

6. If/when an advisory board is established, would you be willing to take an active role?

"Yes, as long as the objectives of the Council are consistent with the scope of my work."

"Yes, but with limited role due to lack of time."

respondees appeared interest to participate

Overall: SHs would like to participate