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D1.2 Technical report on barriers and enablers for coastal restoration upscaling: A multi-level perspective

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Technical report on barriers and enablers for coastal restoration upscaling: A multi-level perspective

Deliverable D1.2

26/05/2023

WP1

Lead beneficiary: EURECAT
Collaborators: Albirem*

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REST-COAST

Large Scale RESToration of COASTal Ecosystems through Rivers to Sea Connectivity

This project receives funding from the European Union's Horizon 2020 research and innovation programme, under Grant Agreement 101037097

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1 Preface

Coastal regions provide some of the most productive and biodiverse environments with an important and often underappreciated carbon storage potential. At the same time, they are among the areas of highest population density, natural assets, and cultural heritage in the world, yet are experiencing significant social, economic and environmental challenges, exacerbated by climate change and human pressures.

The Rest-Coast Project (Large scale RESToration of COASTal ecosystems through rivers to sea connectivity) is an EU Horizon 2020 research project (Grant agreement No. 101037097) whose overall goal is to address with effective and innovative tools the key challenges faced by coastal ecosystem restoration across Europe. The approach chosen for this project will deliver a highly interdisciplinary contribution, with the demonstration of improved practices and techniques for hands-on ecosystem restoration across several pilot sites, supported by the co-design of innovative governance and financial arrangements, as well as an effective strategy for the dissemination of results.

2 Summary

Management and coordinating insufficiencies led to several technical, economic and management barriers that constrain coastal restoration performance. This generates distrust in restoration projects and is also linked to several enablers that can facilitate coastal restoration. In this context, the present technical report is a deliverable that aims to provide information for the nine REST-COAST Pilots on barriers and enablers for coastal restoration upscaling, whose creation is required by Task 1.2, "Implementing hands-on restoration in the Pilots" included in the Work Package 1 (WP1) of the REST-COAST project.

For this purpose, different inquiries were sent to the nine Pilot coordinators as well as the key local stakeholders of each Pilot site to acquire quantitative and qualitative data mainly about technical barriers and enablers for coastal restoration upscaling but also about governance and financial ones. In addition, information about the establishment and development of the COastal REstoration PLATformS (CORE-PLATs) of the different Pilots was collected. The level of commitment from all 9 REST-COAST Pilots as well as SHs organization with all the activities carried out in this analysis was very high.

As a result, updated and exhaustive review was obtained, not only qualitative but also quantitative, on the relevance and frequency of technical, governance and financial barriers/enablers in the nine REST-COAST Pilot sites to establish priorities and guidelines for hands-on coastal restoration. The present report collected not only the expert criteria on coastal restoration from each Pilot's team but also the perspectives of key local SHs from different sectors to integrate the knowledge and interests of all parties involved in coastal restoration. This led to a global picture that integrates the main technical limitations (barriers), successful solutions (enablers) and good practices for coastal restoration upscaling. This deliverable (D1.2) makes available to the REST-COAST partners, and to the stakeholders and restoration practitioners in general, a comprehensive review of the barriers and enablers of coastal restoration. Consequently, it is expected to encourage future discussion and the co-creation in CORE-PLATS becoming, beyond an exhaustive compilation a useful tool for hands-on coastal restoration in the 9 pilot sites of the project and to drive the scaling up on a REST-COAST scale as well.

3 List of abbreviations

EU	European Union
CORE-PLAT	Coastal Restoration Platform
ESS	Ecosystem Services
BDV	Biodiversity
SHs	Stakeholders
SD	Standard Deviation

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4 Introduction

4.1 Brief context of the Deliverable within the REST-COAST

This report emerges from the "Restoration Revolution" proposed in the REST-COAST project, with the aim to tackle managerial gaps in coastal restoration, especially shedding light into the challenging task of overcoming restoration barriers (technical, social, economic, governance, and awareness barriers), as well as by identifying and fostering potential enablers.

Thus, this report constitutes **an essential part of Working Package 1 (WP1), "Hands-on restoration of coastal ecosystems and upscaling potential: technical aspects"**, which is aimed mainly at identifying barriers and enablers for restoration of coastal Biodiversity (BDV) and Ecosystem Services (ESS). This WP includes the creation and analysis of a global database on past and ongoing coastal restoration projects (Deliverable 1.1) to build a common framework to be used in REST-COAST Pilots. It aims at assessing restoration performance, as well as the design of a common monitoring framework (Deliverable 1.3) to evaluate restoration success at the Pilots by means of common ESS and BDV metrics, with the potential to become the steppingstone in upscaling/out scaling these replicable techniques. This will be culminated by the development of common guidelines for up and out scaling restoration in a catalogue format (Deliverable 1.4).

In this context, **Deliverable 1.2 (D1.2) originated with the goal of identifying mainly technical barriers and enablers for coastal restoration upscaling**. However, governance and financial barriers and enablers have also been considered to increase the scope towards the interconnection with further Work Packages from both perspectives: Pilot dimension and stakeholders' (SHs) points of view. Overcoming the restoration barriers, including both latter-mentioned perspectives, is one of the fundamental purposes of the REST-COAST project. It also includes social barriers based on conflicts of interest or perception between development, resource exploitation and natural conservation. To pursue this, the establishment of the Coastal Restoration Platforms (CORE-PLATs) is crucial in terms of facing the current governance system while supporting stakeholder participation and co-development. It means identifying and engaging relevant stakeholders as well as incorporating their knowledge through a co-development process is fundamental to implement hands-on coastal restoration at the nine REST-COAST Pilots and defining the approach for upscaling. This step is derived from the necessity to assess the hands-on restoration by identifying the main technical issues from stakeholder perspectives. Hence, this is a deliverable that can also be used as a state-of the art report regarding the site's specific social-ecological conditions, which essentially considers the main technical issues that the Pilots are encountering. These specific barriers and enablers tackled in this report will later be related to the assessment and quantification of ESS and BDV gains (D1.3), as well as constituting a valuable starting point in terms of potential guidelines for scaling (D1.4).

Furthermore, on a broader scope, the restoration barriers identified in this report, specifically economic ones will connect directly with WP3 on "Financial arrangements/business plans for restoration upscaling", as it aims to scale restoration by overcoming these specific barriers through innovative and sustainable financial arrangements. Similarly, it will also have an impact on the WP5, due to the consideration of governance barriers, and the enablers of stakeholder engagement, as well as on the WP7, enriching the Coastal Restoration Platforms (CORE-PLATs). It will also have obvious implications towards the WP4 "Adaptation management for restoration and upscaling". Additionally, further synergies are likely to appear within all Working Packages, as shown in Figure 1, which are expected to bring cooperation among partners.

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Figure 1. Graphical schematization of REST-COAST information fluxes, from hands-on restoration (left) and adaptation pathways (right), towards risk reduction, new finance, and governance/social transformation. Retrieved from the REST-COAST project proposal.

4.2 Literature Review and Pilots Contextualization

4.2.1 General contextualization and Literature Review

In this section, a general contextualization of the Pilots is developed from the analysis of the literature review, as well as the links and summary of related documents produced under the REST-COAST framework. Thus, this section of the Deliverable 1.2 is also a "state-of-the-art" on the available knowledge and experience on barriers and enablers for coastal restoration. Additionally, under the scope of the REST-COAST project, other documents were produced which were considered to develop this report. This part of the report includes the analysis of the **Deliverable 1.1** (which is an ongoing global database on past and current restoration techniques and its respective barriers and enablers to build a common framework to assess restoration performance), and the "Rest Coast common questionnaire for Pilots initial data gathering".

This deliverable (D1.2) falls within the framework of the first reporting period (from October 2021 to March 2023), within which the **18-month technical report** is also being developed, which includes the description of the work carried out in each work package of the REST-COAST project, considering its specific objectives and its impacts, as well as possible deviations and corrective measures implemented within each work package and each Pilot site.

The starting point in terms of the main technical knowledge on barriers and enablers for coastal restoration stems from Sánchez-Arcilla *et al.* (2022), who established that management and coordinating insufficiencies led to several barriers in restoration, which in turn generate distrust in restoration projects. Therefore, this article exposed the need to address these barriers and this "implementation gap", to seek the restoration upscaling, BDV protection and delivery of ESS. In particular, the following barriers were highlighted: technical (techniques with limited engineering experience and background on restoration ecology), economic (scarce funding and limited long-term commitment), and governance issues (fragmentation which does not address all relevant coastal social-ecological dimensions nor to incorporate long term objectives). All these barriers were considered as a constraint to restoration performance and were also linked to several enablers that can

facilitate restoration, namely biophysical knowledge, economic advances, favorable governance, or social engagement, among others.

Furthermore, the local barriers for coastal restoration upscaling were found to also be extrapolated to the regional or worldwide level, in terms of their upscaling/out scaling potential, and their related complexities. These specific barriers for scaling were classified into: **technical barriers** (limited expertise, knowledge and available data, lack of harmonized metrics, uncertainty on benefits and trade-offs, limited compatibility with existing infrastructure), **financial barriers** (scarce funding and complexities in finding investors on restoration, struggle to monetize ESS and BDV benefits, time-lag between restoration and the appearance of all benefits entailed, insufficient revenues), and **governance barriers** (due to fragmentation, lack of consensus on adaptation pathways, and institutional reluctance to adopt innovative adaptation and restoration techniques). A summary of these barriers and their classification is included in this Deliverable, as Table 1. These barriers on upscaling/out scaling act synergistically and thus hinder the implementation and progress of coastal restoration.

Table 1: Summary of technical, financial and governance barriers to upscale coastal restoration interventions (Retrieved from Sánchez-Arcilla et al., 2022).

Technical	Financial	Governance
○ Engineering expertise	○ Benefit-cost ratios	○ Integrated approach
○ Data and metrics for BDV and ESS	○ Returns from investments	○ Coordinated decision making
○ Monitoring and maintenance plans	○ Business plans suited to local constraints	○ Social perception and pervasive inertia
○ Delayed performance	○ Short term and small-scale bias	○ Short term policies
○ Room for adaptation	○ Long term support	○ Convergence of SH interests

In order to tackle this issue, the article also established some potential scaling **enablers** (see Table 2), which although specific and site-dependable, can equally be categorized into: **technical enablers** (advanced monitoring and modelling, incorporating traditional expertise and knowledge, increasing maintenance of restoration by performance indicators and early-warning systems, intervention planning within a safe operating space), **financial innovations** (such as presenting a benefit-cost valuation tool, incorporating other funding options by means of private, or as part of companies corporate responsibility, or by crowdfunding campaigns options), and **governance enablers** (such as advancing integration towards a systemic approach to restoration; including socioecological models derived from ESS and BDV restoration gains, as well as organizing trainings and forums for stakeholder engagement in CORE-PLATS). A section that delves into the specific barriers and enablers for each Pilot site was developed in this report.

Table 2: Summary of technical, financial and governance innovations that are enablers to upscale coastal restoration interventions (Retrieved from Sánchez-Arcilla et al., 2022).

Technical	Financial	Governance
○ Advanced monitoring and modelling ○ Incorporating traditional expertise and knowledge ○ Increased maintenance of restoration by performance indicators and early-warning systems ○ Intervention planning within a safe operating space	○ Presenting a benefit-cost valuation tool, ○ Incorporating other funding options ○ Innovative value capture instruments and business models ○ Improved capacity to develop business models and bankable plans.	○ Advancing integration towards a systemic approach ○ Inclusion of socioecological models derived from ESS and BDV restoration gains. ○ Trainings and forums for SH engagement in CORE-PLATS

A holistic approach was proposed in adaptation through restoration plans, that considered equally the potential ESS delivery, the coordinated and suitable governance aspects, and the large engagement of SHs. Here, the role of ESS is also to tackle and harmonize the competing interests of different territories, proving the need for a large-scale restoration that reduces risks and improves biodiversity for the full system.

This report links with said article as its main objective is to delve into the present barriers previously identified; which, as mentioned above, cover from technical aspects(e.g. technologies suited to recover local connectivity or lack of homogeneous ESS metrics), social issues(e.g. limited citizen confidence or slow risk reduction through restoration), economic (e.g. discontinued finance or uncertain returns), governance (e.g. present fragmentation and short term priorities) and awareness (e.g. restoration misinformation) standpoints.

4.2.2 The Pilots Background Context and Previous barriers/enablers

The barriers and enablers explained in previous sections were analyzed in relation to each specific Pilot site, as well as its circumstances and background context in previous restoration projects and attempts. Said analysis was pursued at “the Rest Coast common questionnaire for Pilots initial data gathering”, led by the REST-COAST coordinators. This was analyzed with the aim of gaining a first valuable knowledge of the historical and current barriers specific to each of the Pilots, before we delve into the ones that they are currently tackling within the REST-COAST project. One of the main differences between said questionnaire and this current Deliverable is the effort of the present report to integrate the Pilot leader’s and SHs perspectives, promoting the SHs participation in this technical analysis.

In the first attempt to understand and gain more knowledge about technical barriers and enablers, valuable information was extracted. On the one hand, in relation to technical barriers, each pilot identified the following aspects: the Ebro Pilot case emphasized on the mismatch between restoration works and species of interest such as the Iberian tooth carp (*Aphanius iberus*) and several plant species of the genus *Limonium*; as well as the lack of a clear monitoring with performance indicators. Additionally, the Rhone Delta Pilot shed light into the limited knowledge on restoration performance and risks. Similarly, the lack of technical expertise of the local authorities was explained by the Sicily Pilot. This last case also highlighted the issue that climate change risk is addressed generically in current adaptation plans and no specific projections are being provided.

On the other hand, bureaucracy issues were mentioned in the Ebro Pilot case (regarding issues between Catalan and central governments in terms of land ownership and management); as well as in the Arcachon and the Nahal Dalia Pilots (both due to problems in getting permits or authorization), and in the case of Sicily Pilot, as they claimed that there was a limited number of trained public servants focused on reserve management. Regarding governance barriers, the Arcachon Pilot emphasized on the difficulties in transferring project results and onboard local governance; similarly, the Vistula Lagoon Pilot explained about the lack of involvement of the Central Government after restoration completion. One of the most relevant issues that was repeated among several Pilots (namely: Arcachon, Rhone, Sicily) was the issue of socioeconomic tensions and conflicts of interest such as oyster farming (Arcachon), fisheries (Nahal Dalia), the salt production company (abandonment of its activity and no clear equivalent generated by the restoration in terms of activities and economic amounts), and significant local tensions regarding this restoration strategy (Rhone), local farmers and authorities who opposed the establishment of the natural reserve, as well as the uncontrolled touristic pressure (Sicily). Furthermore, for the Rhone Delta Pilot case, this lack of balance with socio-cultural-economic activities was shown since the volumes and quality of freshwater that can enter the site were related to agricultural activities.

In addition, several SHs engagement issues were shown, especially at Foros Bay Pilot, which showed difficulties in engaging SHs in the CORE-PLAT. They considered this issue as one of the main barriers to the proper functioning of the platform and the accomplishment of the restoration goals. Further issues that stem from stakeholders were the following: unwillingness (e.g., from fishery managers to change infrastructure in the Nahal Dalia Pilot, or the NGO questions about co-participating in projects in the Vistula Lagoon), or the local population distrust in restoration (e.g., feeling less well protected from sea intrusions than with historical dikes in Rhone Pilot).

Finally, funding issues proved to be a strong barrier, since they affected each Pilot at some point, mostly due to non-precise estimates of savings in public funds generated by restorations actions, difficulties in attracting public funding, as well as the absence of continuous and committed funding after the restoration project, as it is usually one-purpose funding solely.

Regarding the restoration enablers scope, the analysis of **Milestone 1.3** showed that all the pilots had started the formation of their CORE-PLATs. Thus, the Coastal Restoration Platforms (CORE-PLATs) intend to be a social enabler based on increased engagement and progressive convergence towards decarbonized coastal adaptation at mid/long term, and tangible benefits from applying the early climate warnings at short-mid-term. The aim is that the hands-on coastal restoration activities in the nine REST-COAST Pilots, building upon existing expertise at these Pilots, are co-designed and co-managed by CORE-PLATs (strong stakeholder and civil society engagement) to overcome barriers, promote synergies and quantify gains in ESS/BDV with innovative techniques as restoration enablers under present/future scenarios. However, in some cases, difficulties were found in the process, such as lack of interest of SHs towards the objectives of the project. Overall, it was also mentioned that the existence of previous platforms and boards had enabled the process in several cases.

5 Main goals and specific objectives

The **main objective** of this technical report is to gather updated information regarding both, quantitative and qualitative aspects of the technical but also governance and financial barriers and enablers from each pilot site to analyse in detail the challenges and opportunities faced by different European regions for coastal ecosystem restoration. In this sense, this report delved into the following two assessments. **The specific goal of the transversal assessment of this report is to provide robust information on the constraints and opportunities which the technical, financial and governance barriers and enablers can become in tackling coastal restoration up and out-scaling challenges**. This assessment is providing information regarding the relevance and frequency of those barriers and enablers to establish priorities in different coastal restoration sites. This information is also useful for the achievement of the REST-COAST project' intentions, such as facing large-scale barriers and enablers for coastal restoration, scaling up and building on existing experience, enabling transformation through bottom-up solutions, providing knowledge from stakeholder know-how and technical expertise at the CORE-PLATs for the discussion, and including a cross-border analysis for a systemic coastal restoration up-scaling.

Secondly, in the Pilot level assessment, **this report is carried out with the aim of being a useful tool for all the REST-COAST Pilots by providing updated and detailed information on the barriers and enablers of coastal restoration for each Pilot**, around their context-specific features as well as the information necessary to face the challenges of the CORE-PLATs according to their specific realities and within the framework of the global REST-COAST reality.

All these objectives in this report are set out by focusing on the main objective of the REST-COAST, which is to demonstrate to what extent upscaled coastal restoration can provide a low Carbon (C) solution to climate adaptation and disaster risk reduction for threatened low-lying coastal systems, combined with gains in their BDV status. This solution will be developed by a "Restoration Revolution".

6 Materials & Methods

To co-design hands-on restoration actions in each REST-COAST Pilot, an analysis of technical barriers and enablers for coastal restoration upscaling in the nine Pilots was carried out, focusing mainly on the technical aspects, but also integrating financial and governance barriers and enablers to interconnect with other Work Packages of the REST-COAST project. Information on the barriers and enablers to coastal restoration in each Pilot was collected through a multi-level approach considering the Pilots' knowledge about their pilot sites as well as the perspectives and interests of key local stakeholders. For this purpose, different instruments were produced and disseminated to collect this multi-level information and to have a holistic perspective of each Pilot site as well as a global vision at the REST-COAST project level.

6.1 Data Collection

A first **pre-diagnosis form** was created and shared with the nine Pilots of the REST-COAST project to have the preliminary information of each Pilot site before hands-on restoration about the state of the CORE-PLATs constitution and their evolution, to know how the Pilots are addressing the barriers and enablers for the coastal restoration projects with the local stakeholders and to assess the interest of the latter in being involved in the CORE-PLATs process (Annex I). Secondly, **a form to send to local SHs of each Pilot** (CORE-PLAT) was developed with the aim of gathering their impressions and perspectives about enablers and barriers for restoration upscaling (Annex I). In addition, two instruments were developed to collect information from the nine Pilot cases: i) **an instrument to collect quantitative information** (MsExcel sheet) about barriers and enablers to coastal restoration upscaling at each pilot site based on their own expert criteria (Annex II), together with the instructions to fill out this instrument; and ii) **a template document to provide qualitative**

information (MsWord) on the particularities of each Pilot case and the context-specific information about barriers and enablers in each Pilot region (Annex II) as a complement to the quantitative information provided in the previous instrument.

6.2 Interaction and contact with the Pilots

Once the results of the pre-diagnosis were shared with the nine REST-COAST Pilots, the materials and instruments developed to obtain information (with a multi-level approach on the barriers and enablers for coastal restoration upscaling) were sent to the main actors in each Pilot site (SHs and Pilots), following the following steps. On the one hand, the local SHs form was sent to key local SHs of each Pilot (CORE-PLATs) to gather their perspectives. On the other hand, the instruments to collect information of each pilot case were sent to the Pilots to compile quantitative (MsExcel sheet) and qualitative information (MsWord) on the barriers and enablers for coastal restoration upscaling. The quantitative information was collected by each Pilot, mainly based on their expert criteria and technical knowledge. During this process, responses from key local SHs were gathered and sent to the Pilots to integrate the SHs' inputs with the information the Pilots collected about the barriers and enablers of each pilot site to provide some insights in the qualitative information document. Finally, all the inputs from the nine REST-COAST Pilots were integrated to prepare this technical report on barriers and enablers for coastal restoration upscaling (D1.2).

6.3 Data Analysis

Firstly, for each of the nine REST-COAST Pilots, the data collected through the various instruments described in the section 3.1 and following the methodology reported in the section 3.2 was harmonized. Secondly, a qualitative and quantitative analysis on technical, financial and governance barriers and enablers for coastal restoration upscaling was conducted. This was a multi-level analysis that integrated i) the Pilot level, which consists of a vertical approach to study in detail the specific situation for coastal restoration upscaling of each individual pilot site; and ii) the REST-COAST project level, that is a global bottom-up analysis at the REST-COAST project level, which is based on the integration of information from the nine REST-COAST Pilots.

6.3.1 Preliminary approach to address barriers and enablers

On the one hand, a qualitative analysis of the results of the **pre-diagnosis with the Pilots** was carried out to have a preliminary overview of each pilot site of the project before hands-on restoration. In this preliminary approach, the following aspects were assessed: i) the state of constitution of the CORE-PLAT and its evolution; ii) the CORE-PLAT discussion on barriers and enablers for coastal restoration projects; iii) the degree of comfort of the Pilots in filling out a form on barriers and enablers for coastal restoration; and iv) the degree of comfort in sending an equivalent form to key local SHs. On the other hand, **the participation of the key SHs of each Pilot** in the analysis of barriers and enablers for restoration (participation in the form) was analysed to know the representativeness of the CORE-PLAT and the local SHs groups of each Pilot who participated in this analysis. General SHs' perspectives on the barriers and enablers for coastal restoration were collected for each pilot site.

6.3.2 Barriers and enablers to coastal restoration upscaling in the REST-COAST Pilots

The analysis of the barriers and enablers of each REST-COAST pilot site was carried out in three main dimensions. First, **a qualitative analysis of the convergence between the Pilot and SHs perspectives was carried out by assessing a total of 25 barriers and 13 enablers proposed in the forms sent to both groups**. Detailed information was extracted from this analysis on the degree of coincidence of the barriers/enablers identified in each pilot site by integrating the SHs' perceptions with the Pilot analysis. Both the barriers/enablers identified and not identified by the Pilot as well as the SHs were analysed, and the percentage of SHs that identified each one of the barriers/enablers was calculated. Likewise, the degree of coincidence of the barriers/enablers identified by both groups was analysed. The coincidence between the

Pilot and the SHs was scored 1 while the high coincidence was scored 2. The number 0 meant that there were no coincidence barriers/enablers. In addition, in this section, the barriers/enablers proposed by the Pilot and the SHs of each pilot site, called “Proposed barriers”, were also compiled.

Secondly, **a quantitative analysis to assess the importance of the technical, governance and financial barriers/enablers at each pilot site according to the Pilot criterion was carried out**. In the case of barriers, this analysis included some more technical barriers, called “Further barriers”, which were integrated only in the prioritization analysis made by the Pilots. **The barriers/enablers were prioritized according to the relevance and the frequency determined by each Pilot**. On the one hand, the value of the relevance of the barriers/enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, barriers/enablers scored between 4 and 5 were considered “highly relevant barriers” while barriers/enablers between 1 and 3 were considered “less relevant barriers”. The number of highly relevant and less relevant barriers/enablers for each pilot site was calculated, as well as the percentage of highly relevant barriers/enablers of each type, including technical, governance and financial. On the other hand, the value of the frequency of the barriers/enablers was between 1 (the Pilot never have to deal with this barrier; this enabler never occurs) and 5 (the Pilot always must deal with this barrier; this enabler always occurs). In the analysis, barriers/enablers scored between 4 and 5 were considered “highly frequent” while barriers/enablers scored between 1 and 3 were considered “less frequent”. Of those highly relevant barriers/enablers (scored 4-5), the most frequent ones (scored 4-5) were identified and listed. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one. Thus, the total barriers/enablers of each REST-COAST pilot site were ordered according to their importance for the Pilot, first by their relevance (from highest to lowest relevance) and then, by the frequency (from highest to lowest frequency). **A ranking of the total barriers/enablers for coastal restoration upscaling identified by each REST-COAST Pilot, including technical, governance and financial as well as those proposed by the Pilot, was developed and compiled in a table, one for barriers and one for enablers**. Furthermore, the relevance and frequency scores of each pilot site were compared with the REST-COAST average of the relevance and frequency of each one of the barriers/enablers to integrate each Pilot within the global analysis of the REST-COAST project. Thus, the REST-COAST average for barriers and enablers was calculated considering the data from the 9 Pilots of the project. Then, the standard deviation of the Pilot’s score with respect to the REST-COAST average was also calculated to analyse the deviation and alignment of each Pilot with the REST-COAST global trends.

In addition, for each pilot site of the REST-COAST project, **focusing on technical barriers and enablers, they were represented according to their relevance and frequency by a scatter graph**. In this graph, the frequency was a function of relevance, and the distribution of the barriers/enablers was represented according to these parameters to detect which barriers/enablers had the highest scores and they should be prioritized in the coastal restoration upscaling in each pilot site.

Finally, **an analysis of the connections between the technical barriers/enablers with the financial and governance ones was carried out**, also integrating the new barriers/enablers proposed by each Pilot (if any). Firstly, for each of technical barriers/enablers identified by each Pilot, the connections with the governance and financial barriers/enablers were determined and “weak connections” were scored with 1 (occasional connection) and “strong connections” with 2 (frequent connection). In case of no connection between two barriers/enablers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers/enablers were added and a summary of the total strong and weak connections of each of the technical barriers/enablers with each group of barriers/enablers (governance and financial) was compiled into a table, one for barriers and another one for enablers.

6.3.3 Barriers and enablers to coastal restoration upscaling: a REST-COAST scale approach

The overall results at a REST-COAST project scale were conducted by aggregating all the individual (per Pilot) sources of information in the previous steps of this exercises. Thus, the results of the **pre-diagnosis** form were conducted to update and assess the formation of the CORE-PLATS. Additionally, a broad appproach to local stakeholders was included in the pre-diagnosis form to capture their impressions regarding the barriers and enablers within the framework of this deliverable. All these contributions, together with the background of technical and scientific teams of the 9 CORE-PLATS (belonging involved in the REST-COAST project were aggregated to count on results at a multi-level approach:

- **Pilot level:** A vertical approach to the specific situation of each individual Pilot (see Section 7.2). Thus, the results of each of the Pilots were structured as a functional document, that provides outcomes at various levels and works as direct feedback to the local CORE-PLATS that participated in the study.

- **REST-COAST project level:** The integration of information from all Pilots led to a bottom-up analysis of the REST-COAST project scale (see Section 7.3). Within the overall consortium analysis, relevance and frequency of barriers and enablers were explored at three levels. The first part considers the global list of the barriers and enablers identified in this analysis that is, those were proposed by the Pilots and SHs of each of the Pilot cases of the project, which expand the conceptual framework that was the basis of D1.2. (Sánchez-Arcilla *et al*. 2022). Secondly, results of the quantitative analysis are presented, in which the barriers and enablers were prioritized according to the relevance and the frequency determined by concerning the convergence between the SHs and Pilot perspectives for the overall project consortium. Thus, a ranking of the total barriers/enablers for coastal restoration upscaling identified by each REST-COAST Pilot, including technical, governance and financial as well as those proposed by the Pilot, was developed and compiled in a table, one for barriers and one for enablers, also with the REST-COAST average calculation. Standard deviation also was calculated to assess the dispersion within the results of the sample. Finally, the graphical representation in a scatterplot of relevance and frequency of technical, governance and financial barriers allowed its aggregation and analysis at a global project scale.

7 Results

The following section presents the achievements in terms of barriers and enablers for restoration up-scaling assessed in Deliverable 1.2. **Our main objective was fulfilled, as we obtained updated information, not only qualitative but also quantitative, on the relevance, frequency, priority, and importance of technical[1], governance and financial barriers/enablers in the Pilot sites**. In this regard, this exercise makes available to REST-COAST team, SHs and restoration practitioners in general, **a comprehensive review of the barriers and enablers that will encourage future discussion and co-creation in CORE-PLATS, to drive the scaling up on a REST-COAST scale as well**.

Going into detail, the results of the **pre-diagnosis** form (see section 7.1) showed a solid basis to structure the discussion on barriers and enablers in the REST-COAST project. On the one hand, this can be seen in the formation of the CORE-PLATS themselves, that emerged as a key local governance structure to focus the discussion on upscaling future restoration activities, also connecting with previous interactions. On the other hand, the pre-diagnosis also paved the way to approach local stakeholders and capture their impressions regarding the barriers and enablers within the framework of this deliverable. All these contributions, together with the background of technical and scientific teams of the 9 CORE-PLATS (belonging to each of the 9 Pilots)

[1] As mentioned before, technical barriers and enablers were the core of this assessment.

involved in the REST-COAST project, gave rise to an accurate picture of the factors that might block or enhance the practice of restoration. The results are presented in a multi-level approach:

- **Pilot level:** A vertical approach to the specific situation of each individual Pilot (see Section 7.2). Thus, the results of each of the Pilots were structured as a functional document, that provides outcomes at various levels and works as direct feedback to the local CORE-PLATS that participated in the study.
- **REST-COAST project level:** The integration of information from all Pilots led to a bottom-up analysis of the REST-COAST project scale (see Section 7.3). Thus, some common trends emerged, showing similarities within the pilot cases, which could be extrapolated to a broader scale in coastal restoration practice. On the contrary, some particularities were related to local processes that also provide a relevant diversity in the casuistry of coastal restoration that covers the entire project consortium.

7.1 Preliminary results from the pre-diagnosis with the Pilots

The pre-diagnosis form sent to the 9 pilots was answered on time by all the Pilots (Vistula Lagoon, Wadden Sea, Foros Bay, Nahal Dalia, Venice Lagoon, Ebro Delta, Rhone Delta, Arcachon Bay and Sicily) representing 100% of participation. The first question, regarding the constitution of the CORE-PLATs was positively answered by most pilots (89%) and negatively by only one (11%). These results showed that, *de facto*, all CORE-PLATS were operating as Sicily planned a kickoff meeting of its local CORE-PLAT a few days after the pre-diagnosis request. This positive result in terms of CORE-PLAT existence constitutes an essential foundation for the current analysis on barriers and enablers. Then, how CORE-PLATs dealt with barriers and enablers for coastal restoration projects in each Pilot was explored. In general terms, results showed that most of the Pilots implicitly considered barriers and enablers for restoration projects in their previous interactions with local SHs. However, there was a broad dispersion on how formally or explicitly this discussion has been taking place for most of the local platforms in the REST-COAST project. three main situations:

- **Formal discussion:** 4 of the 9 CORE-PLATS showed an *ad hoc* discussion on barriers and enablers with local SHs. One example is the Rhone Delta Pilot, that stated a regular discussion on its CORE-PLATS about barriers and enablers, in meetings that have been taking place every 2 months. Furthermore, the Venice Lagoon Pilot held a workshop with SHs on co-planning of the environmental restoration in the lagoon, that included some specific questions, previously and *ad hoc* prepared, to explore barriers and enablers. In the Nahal Dalia Pilot, they already held bilateral meetings and a workshop with SHs that specifically covered the discussion on barriers and enablers for coastal restoration. In the Vistula Lagoon CORE-PLAT, SHs had already discussed about some key barriers for the Pilot in the appearance of its target habitat for restoration, the grassland, as there is a very long consolidation time of the muddy sediments that might difficult it.

- **Informal discussion:** 4 of the 9 CORE-PLATS approached the topic of barriers and enablers with local SHs but with some differences on how this discussion took place. For the Wadden Sea Pilot, the Eems-Dollard 2050 program has a long tradition of stakeholder interaction running since 2016. It has already included several pilot projects and its up scaling, based on the interaction with local stakeholders to explore the potential of raising the coastal zone by using sediment of the estuary, that implicitly covers barriers and enablers. The Sicily Med Island Pilot already had some small groups discussions with local stakeholders regarding the barriers and enablers, and when we conducted this pre-diagnosis, they were about to hold a formal meeting for the CORE-PLAT that would probably cover the topic too. Regarding the Ebro Delta, it was not explicitly addressed, but the SHs informally discussed the topic at the first CORE-PLAT meeting. Therefore, some of their impressions were identified to feed the future discussion around barriers/enablers in the Ebro Delta, especially for the case of the restoration of

sediment fluxes from river to coast. In the Arcachon Bay Pilot, there was an interaction with the main local SHs, that included some collaborative workshops and several bilateral call/meetings, to progress in its restoration approach.

- **Scheduled discussion:** Finally, in the Foros Bay Pilot, barriers and enablers for coastal restoration have not yet been addressed in their CORE-PLAT, but they already planned to discuss this topic in future meetings.

Consequently, most of key local SHs were, somehow, familiar with a certain degree of discussion on barriers and enablers for coastal restoration. Thus, in the pre-diagnosis, the feasibility of sending a form to the key SHs in the CORE-PLATs of each pilot site was also explored to collect their perspectives on the enablers and barriers for restoration upscaling. The answer of four of the Pilots (Vistula Lagoon, Venice lagoon, Ebro Delta and Sicily Med Island) was positive and showed a high proactivity in receiving and sending the form, while other three Pilots (Eems-Dollard, Foros Bay and Arcachon Bay) were also affirmative, although they assumed that some stakeholders may not answer to these forms depending of its level of complexity and stakeholders profile (e.g. “citizen” stakeholders would have a lower potential to engage with this technical discussion compared to “institutional” stakeholders). Finally, two pilots (Nahal Dalia and Rhone Delta) proposed to discuss the issue of “how to filter the stakeholders”. All these inputs were explored and contrasted in a specific meeting with REST-COAST Pilots, that approved the launch of the SHs’ form and improved its design scheme.

Additionally, the pre-diagnosis also included a question, as a contingency plan, in case it had not been feasible to send the form to local stakeholders. This question was about the level of comfort of Pilot scientific teams to fill out a request on barriers and enablers of coastal restoration only with their own expert criteria and integrating their impressions on external stakeholders’ perspectives on barriers and enablers. The range of answers goes from 1 (i.e., “Not very comfortable, we don’t have a lot of information about it”) to 5 (i.e., "No problem, we know a lot about the situation, and we can extrapolate our stakeholders' perspectives about it”). Most of the Pilots’ answers were between 3 (33%) and 4 (44%), which showed that, in general, the Pilots felt comfortable and were aware of local SHs’ main impressions on barriers and enablers. However, our overall pre-diagnosis results showed that SHs’ form was feasible to be launched and it was not necessary to activate the contingency strategy, as it was poassible to gather direct inputs from 55 local SHs.

7.2 Specific Results per Pilot

7.2.1 Wadden Sea Pilot – barriers and enablers local report

7.2.1.1 Pilot context

Pilot regional context[2]

The Wadden Sea is one of the three Core Pilots of the REST-COAST project. This Pilot is a transboundary site in the North Sea and comprises 300,000 ha of intertidal seagrass, and the German Jade, Weser, Elbe Ems-Dollard estuaries with 23,800 ha of saltmarshes. The restoration goal is to revert the triple saltmarsh and “polder” area into its natural state. Currently, there is a development of a policy for ecological sediment management in Lower Saxony. The process is supported by Dutch-German cross border administrative interaction. There, the policy development is accompanied by scientific research (NLWKN-FSK) to quantify

[2] The following information has been gathered from the Pilots’ contribution to the current deliverable, as well as from the background context provided on the “REST-COAST common questionnaire for Pilots initial data gathering”, led by REST-COAST coordinators.

sediment transport paths and develop methods to evaluate seagrass and mussel field impacts. Hence, the ecological sediment management itself can be considered as an NBS. The project implementation stands on a close collaboration between government bodies, the business community and nature conservation organizations. This relies on the principle of joint ownership to achieve the ecological target situation and proper programme functioning. The responsibilities are varied: the **national government** has a great responsibility for water management and the achievement of nature conservation objectives in the Ems estuary; **Water boards**, **municipal authorities** and the **Province of Groningen** are responsible for the management of natural areas along the edges of the estuary, for ensuring hydrogeological safety and for maintaining and reinforcing liveability along the Ems-Dollart coastline; the **Groninger Landschap** is responsible for the management of the salt marshes and (new) nature areas. The commitment and innovative force of the **business and agricultural community**, **Groningen Seaports** and **knowledge institutes** are essential if various initiatives are to be successfully introduced. Reinforcing the collaboration with Germany remains an important spearhead of the programme, especially as they aim to tackle a mutual target situation for sediment management into concrete agreements on the exchange of knowledge and collaboration in projects.

Pilot current situation regarding barriers and enablers for coastal restoration

The Pilot stated that the current limits in technical experience and scientific understanding are hindering both policy development and implementation of specific NBS. Additionally, in terms of difficulties in upscaling, there are expected issues since complex modelling is expected to be problematic. There is an overall lack of experience with NBS implementations. The suggested general enabler would be to consider it as an interdisciplinary challenge. There is a broad willingness to improve coastal restauration, but little site-specific experience. Moreover, even though modelling bears its own complexities, it is also the key to get site specific insights into quantitative sediment transport paths, what-if-scenarios, etc. Thus, this knowledge is believed to be necessary to prepare policies as well as tailored restoration efforts.

The CORE-PLAT Status

CORE-PLAT members

The most important SHs on the territory and their main interests are the following: Government (climate risk reduction, carbon emission management), Seaport authority's, nature organizations (ecological restoration), local farmers, Water authorities, Water boards, industry, inhabitants. The SHs that have already engaged, according to the Pilot leaders, include all the actors with a high power, that is, a high probability of triggering a barrier/enabler in the restoration objectives. Numerous public administrations responsible of the area's management at different scales (local, regional, and national) are onboard, as well as organizations of farmers and engineers and ecologist associations (see Figure 2). Other parts which have not been involved yet are most of the industries present in the area, such as fisheries, food, energy and naval companies, as well as banks and media, although most of those are believed to have less power in the area.

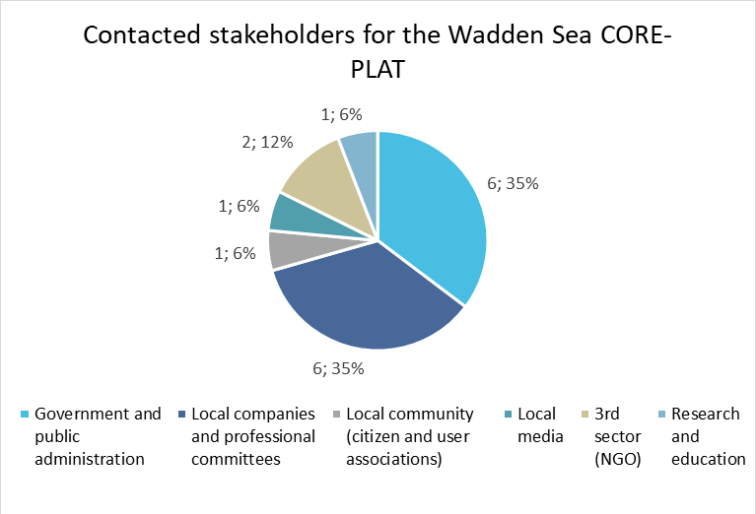

Figure 2. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Wadden Sea in November 2022 (Information retrieved and adapted from the M1.3).

Developed activities[3]

The kick-off meeting of the CORE-PLAT took place in October 2021. Since then, 4 networking activities involving SHs were conducted until March 2022, combining field trips and webinars attended by a few actors. In October 2022, a year after the kick-off, the follow-up of the CORE-PLAT involved all the engaged SHs. Seven more events were expected to take place between January and May 2023. Another interesting initiative they brought on was to engage and promote the participation of SHs by means of the Climate Café: this is about using "storytelling and sketching as methods to connect SHs, motivate action, evoke recognition in a jointly formulated goal, such as taking climate action". The Climate café for the REST-COAST case consisted of a field trip to investigate the Pilot results regarding the cross-border ecological sediment management of the area.

7.2.1.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

The Pilot stated the highest level of comfortability on the pre-diagnosis, in terms of filling a request on barriers and enablers for coastal restoration with their own information (expert criteria), also considering some SH' perspectives. As they stated: "they knew a lot about the situation, and they could extrapolate their SH perspectives about it". Regarding their SHs platform, they emphasized that it has been functioning since 2016. Thus, they are currently scaling up the previous Pilot projects with the SHs.

Key stakeholders' perspectives on barriers and enablers

In the Wadden Sea Pilot, the above-mentioned form was answered by 5 SHs (see Figure 3). **Among respondents, all belong to Government and Public Administration (with 100% of the participation)**. These are: Province of Groningen, GSP, Lower Saxony Wadden Sea National Park Administration, Federal Waterways Engineering and Research Institute, and the NLWKN.

[3] The information has been gathered for a preliminary understanding of the pilot' state of art, as a knowledge input for the unfolding of D1.2

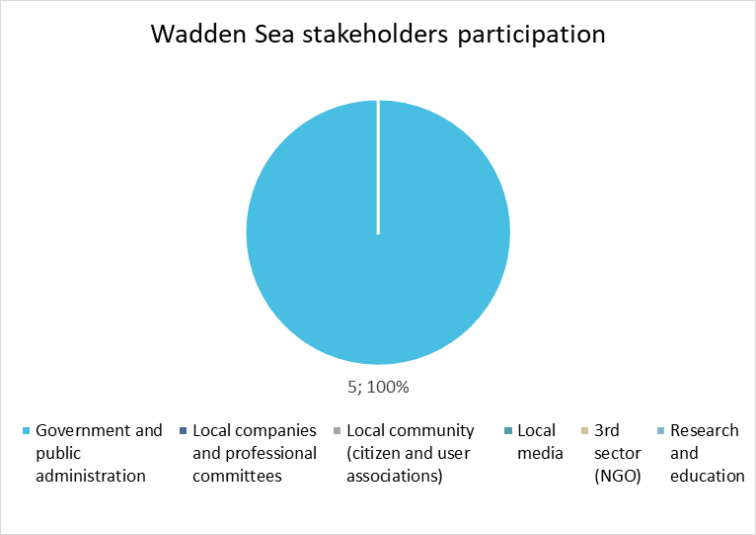

Figure 3. Key local stakeholders of the Wadden Sea Pilot that participated in the form.

On average, the Wadden Sea Pilot highlighted feeling highly comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 4.25 on five-point scale). This positive perception can be considered as an "enabler", as it might enhance the discussion in the frame of the REST-COAST project. **Governance was seen by all SHs as the main barrier category to coastal restoration in the Wadden sea Pilot, and the main potential enabler**. They lightly agreed with the perception of barriers as a relevant factor that has hampered coastal restoration efforts (average score is 3.6 on a five-point scale). Also, there was clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the past in the pilot area (average score is 4.2 on a five-point scale).

7.2.1.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Wadden Sea Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritised according to the relevance and the frequency determined by the Wadden Sea Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences on Perspectives from Pilots and SH views: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Wadden Sea pilot site, by integrating the SHs' perceptions with the Pilot analysis. Both barriers identified and not identified by the Pilot and SHs, the percentage of SHs that identified each of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 3). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 17 of the barriers, which means a higher level of alignment between both perspectives (68%, n=25).
- 29% (n=5) of the identified barriers by both groups were highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- In 71% (n=12) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

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Table 3

Identified and unidentified barriers by the Pilot and SHs in the Wadden Sea pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Wadden S. Pilot level	Wadden S. SH1: Government and public admin.	Wadden S. SH2: Government and public admin.	Wadden S. SH3: Government and public admin.	Wadden S. SH4: Government and public admin.	Wadden S. SH5: Government and public admin.	Wadden S. SHs (%)	Wadden S. Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)							60%	2
	Lack of data and metrics for biodiversity							-	0
	Lack of data and metrics for ecosystem services, ecological processes and functions							20%	1
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)							-	0
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)							40%	1
	Delayed performance of restoration projects							20%	1
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)							-	0
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)							40%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)							60%	2
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)							40%	1
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)							100%	2
	Limitations in coordinated decision making							-	0
	Lack of social engagement in restoration activities							20%	1
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)							20%	1
	Focus in short term policies							-	0
	Lack of convergence in stakeholders' interests							40%	1
	Lack of laws and policies engaging conservation, management and restoration of natural environments							60%	2
	Bureaucratic issues or delays in authorising the work or receiving work permits							40%	1
	Dealing with socioeconomic needs							-	0
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions							20%	1
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)							60%	2
	Low SHORT-TERM returns from investments							-	0
	Short term and small-scale bias							-	0
	Business plans bound to local constraints							20%	1
	Lack of long-term economic support							40%	1

Highest coincidence

The highest coincidence is shown on the governance barrier of "lack of integrated approach (i.e., interdisciplinary and coordinated action among SHs)", with 100% of the SHs from all sectors in agreement with the Pilot.

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

One of the SHs highlighted the limited combined knowledge of engineering and ecology/biology.

Governance

The Wadden Sea group of the SHs detected the following barriers:

- "Available manpower at administrative level (technical and governance)."
- "When things get tense, some (functionally minded) partners tend to stick to only their own tasks."
- "Finding solutions is highly complex. The requirements of SHs vary widely. There are no easy solutions."

Financial

- "Renaturation should reduce costs in the long term."
- "Search for a balance between social and private benefits versus costs."

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section the information shows quantitative differences between the prioritisation of the barriers at each Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 30 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 9 (30%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 21 (70%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 67% and 33%, respectively (Figure 4).

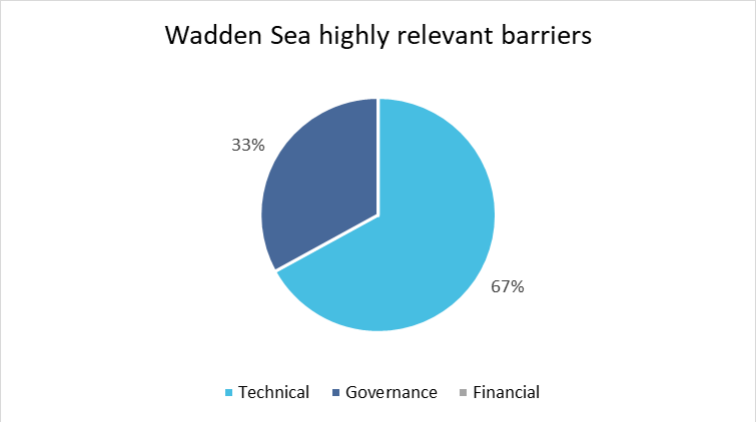

Figure 4. Highly relevant technical, governance and financial barriers in the Wadden Sea pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always have to deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 9 highly relevant barriers), 44% (n=4) were diagnosed as highly frequent by the Pilot, always appearing while developing restoration in the Wadden Sea Pilot. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area. Those are the most relevant and frequent:

- "Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)".
- "Available manpower at administrative level (technical and governance)".
- "Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)".
- "Limited combined knowledge of engineering and ecology/biology".
- "Bureaucratic issues or delays in authorising the work or receiving work permits".
- "Lack of data and metrics for ecosystem services, ecological processes and functions".
- "Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)".
- "Insufficient restoration pace/scale with uncertain benefits and trade-offs".
- "Dealing with socioeconomic needs".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Wadden Sea Pilot (scored with a value of 5 in relevance and frequency), the most important technical barrier in this pilot site was the "**physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**". The proposed barrier by the Pilot "available manpower at administrative level (technical and governance)" was also highly relevant (scored with 5) but less frequent (see Table 4).

The following table (Table 4) contains the list of all the barriers identified by the Wadden Sea Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Wadden Sea Pilot were compared with the REST-COAST average of each of the barriers to integrate the present Pilot within the global analysis of the 9 Pilots of the

REST-COAST project. Considering the previous barrier above (scored with a value of 5 in relevance and frequency), the "physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability" is the closest to the REST-COAST average, for relevance (SD 0.4), and frequency (SD 0.9). It is also worth to highlight higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends, as the "**lack of convergence in stakeholders' interests**" (SD 1.3), which was not scored as relevant for this Pilot, and it was not aligned with the global REST-COAST. Similarly, the "**lack of long-term economic support**" was perceived to be much less relevant and frequent than for the global REST-COAST average (SD 1.8 for both). Additionally, "**short term and small-scale bias**" was perceived to be much less frequent for the Wadden Sea Pilot than for the REST-COAST average (SD 2.0). Similarly, the "**low short-term returns from investments**" was perceived to be much less frequent for the Wadden Sea Pilot (SD 2.0) than the global REST-COAST average, as well as being perceived as much less relevant for the Pilot than for the global (SD 1.7).

Table 4

Ranking of the total barriers for coastal restoration upscaling identified by the Wadden Sea Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 pilot sites of the project, as well as the standard deviation of the Wadden Sea Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Wadden Sea pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Wadden Sea pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	5	3.8	0.9
Governance barriers	Proposed barriers	Available manpower at administrative level (technical and governance)	5	-	-	3	-	-
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	4	4.0	0.0	4	4.0	0.0
Technical barriers	Proposed barriers	Limited COMBINED knowledge of engineering and ecology/biology	4	-	-	4	-	-
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	4	3.7	0.2	4	3.4	0.4
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	4	4.3	0.2	3	3.7	0.5
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	4	2.9	0.8	3	2.2	0.5
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	4	3.1	0.6	3	3.6	0.4
Governance barriers	General barriers	Dealing with socioeconomic needs	4	4.2	0.2	3	4.2	0.9
Governance barriers	General barriers	Focus in short term policies	3	3.3	0.2	4	3.4	0.4
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	3	2.8	0.2	3	3.1	0.1
Technical barriers	General barriers	Lack of data and metrics for biodiversity	3	3.1	0.1	3	2.8	0.2

Technical barriers	Further barriers	Acute degradation level and divergence in target state	3	3.4	0.3	3	3.6	0.4
Governance barriers	General barriers	Limitations in coordinated decision making	3	3.4	0.3	3	3.6	0.4
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	3	3.4	0.3	3	3.4	0.3
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	3	3.6	0.4	2	3.4	1.0
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	2	3.9	1.3	4	4.2	0.2
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	2	2.8	0.5	4	2.9	0.8
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	2	3.0	0.7	2	3.1	0.8
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	2	4.0	1.4	2	3.9	1.3
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	2	4.2	1.6	2	3.9	1.3
Financial barriers	General barriers	Lack of long-term economic support	2	4.6	1.8	2	4.6	1.8
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	2	3.1	0.8	1	3.0	1.4
Technical barriers	General barriers	Delayed performance of restoration projects	2	2.6	0.4	1	2.6	1.1
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	2	2.6	0.4	1	1.9	0.6
Financial barriers	General barriers	Short term and small-scale bias	2	3.8	1.3	1	3.9	2.0
Financial barriers	General barriers	Business plans bound to local constraints	2	3.2	0.9	1	2.9	1.3
Governance barriers	General barriers	Lack of social engagement in restoration activities	1	3.3	1.6	3	3.3	0.2
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	1	3.0	1.4	1	3.1	1.5
Financial barriers	General barriers	Low SHORT-TERM returns from investments	1	3.9	2.0	1	3.4	1.7

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of barriers according to these parameters and detect the barriers which are more important to address in the Wadden Sea pilot site (Figure 5). In the upper right quadrant, the technical barriers with the highest score were collected, which had the greatest relevance and frequency for the Pilot, which should be the priority technical barriers to address by the Pilot and the CORE-PLAT. The "**physical context specific of the site"** followed by "difficulties related to management plans" and the "limited COMBINED knowledge of engineering and ecology/biology". It is also worth highlighting the following barriers due to their frequent occurrence, although they are considered less relevant than the previous ones by the Pilot: "lack of data and metrics for ecosystem services", the "Insufficient restoration pace/scale", "lack of physical room for restoration", following by "limited engineering & ecological expertise", the "lack of data and metrics for biodiversity" and finally the "acute degradation level & divergence in target state".

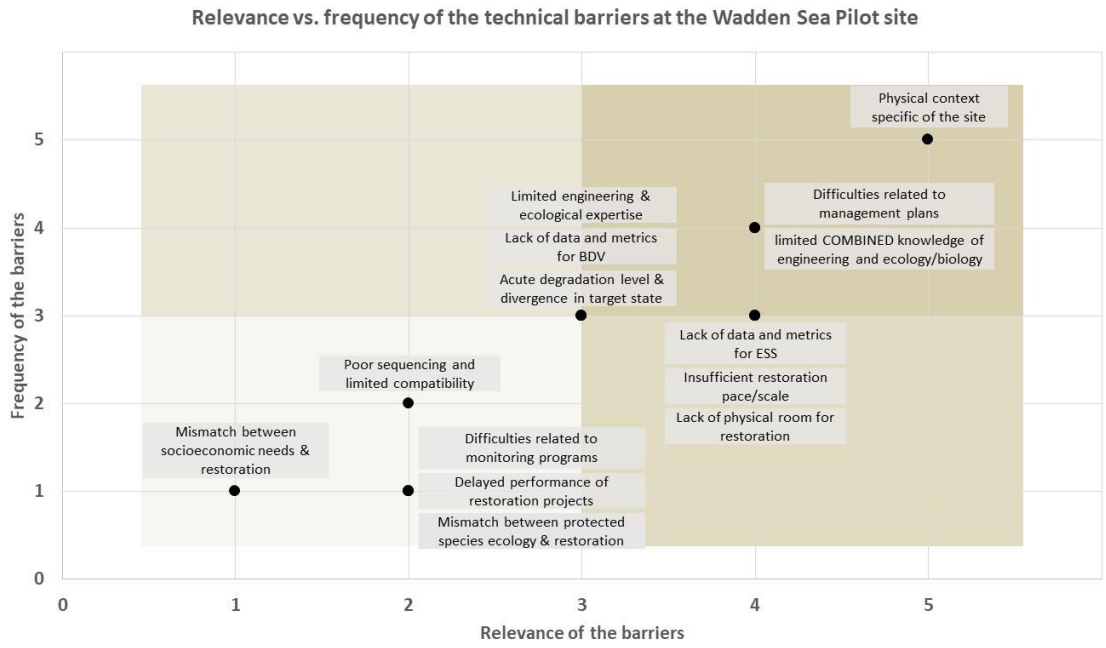

Figure 5. Relevance and frequency of the technical barriers at the Wadden Sea pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Wadden Sea pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 5). "**Limited combined knowledge of engineering and ecology/biology**" was considered the technical barrier that the highest score of connections to governance and financial barriers, followed by "**limited engineering and ecological expertise**". A greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus, these barriers should be addressed as a priority, as these may become a stronger impediment to coastal restoration.

Table 5

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Wadden Sea pilot site.

		Wadden Sea Pilot													
		TECHNICAL BARRIERS													
		General barriers										Further barriers			Proposed barriers
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	Lack of data and metrics for ecosystem services, ecological processes and functions	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and trade-offs	Poor sequencing and limited compatibility with existing infrastructure	Limited COMBINED knowledge of engineering and ecology/biology
Governance barriers	STRONG connections	6	2	2	0	4	2	2	0	0	4	0	2	2	8
	WEAK connections	7	9	9	10	8	9	9	10	10	8	10	9	9	6
Financial barriers	STRONG connections	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WEAK connections	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Score of STRONG connections between barriers	6	2	2	0	4	2	2	0	0	4	0	2	2	8
	Score of WEAK connections between barriers	13	15	15	16	14	15	15	16	16	14	16	15	15	12
	Total score of connections between barriers	**19**	**17**	**17**	**16**	**18**	**17**	**17**	**16**	**16**	**18**	**16**	**17**	**17**	**20**

7.2.1.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Wadden Sea Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritised according to the relevance and the frequency determined by the Wadden Sea Pilot. Finally, there is an analysis of the connections between the technical enablers with the financial and governance ones.

Coincidences on Perspectives from Pilots and SH views for both Pilots and SH: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Wadden Sea pilot site, by integrating the SHs perceptions with the Pilot analysis:

- The Pilot and the SHs coincided in 12 of the enablers, which represents a very high proportion (92%). Moreover, to have an aligned view on enablers could be a relevant factor to boost the practice of restoration in the area.
- The enablers in which the most concurrence was shown gathered 100% of the SH attention.
- 33% (n=4) of the identified enablers were highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- In 62% (n=8) of the enablers, the Pilot coincided with less than 50% of the SHs.

Both enablers identified and not identified by the Pilot and SHs, as well as the percentage of SHs that identified each of the enablers and the degree of coincidence of the enablers identified by both groups were compiled in the table below (Table 6).

Table 6

Identified and unidentified enablers by the Pilot and SHs in the Wadden Sea pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Wadden S. Pilot level	Wadden S. SH1: Government and public admin.	Wadden S. SH2: Government and public admin.	Wadden S. SH3: Government and public admin.	Wadden S. SH4: Government and public admin.	Wadden S. SH5: Government and public admin.	Wadden S. SHs (%)	Wadden S. Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)							60%	2
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)							40%	1
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)							40%	1
	Proactive maintenance with performance indicators							20%	1
	Willingness to promote restoration among stakeholders							100%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)							60%	2
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)							40%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)							60%	2
	New plans for transition in governance (promoting participation and sharing the benefits)							-	0
	Continued training for deeper stakeholder involvement							40%	1
FINANCIAL ENABLERS	Increasing restoration funding							20%	1
	Innovative value-capture instruments and business models							20%	1
	Improved capacity to develop business models and bankable plans							20%	1

Highest coincidence

- The highest coincidence was on the governance enabler of “willingness to promote restoration among stakeholders”, which was identified by 100% of the SHs from all sectors in agreement with the Pilot.
- Other of the highest coincidences is the technical enabler of “advanced forecasting models that support connectivity restoration (e.g. sediment transport modelling)”, as well as the following governance enablers: “there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)” and “new policies towards decarbonised coastal protection (e.g. NBS vs. Grey infrastructure)” which have gathered a 80% of the SHs attention.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. It is:

Financial

- "Through interventions in the area, there will be future prospects and job retention."

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section the information shows quantitative differences between the prioritization of the enablers at the Wadden Sea Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 13 enablers were diagnosed and valued, including technical but also financial and governance ones.
- A total of 4 enablers (31%) of those diagnosed enablers are highly relevant (valued between 4 and 5) while 9 enablers (69%) were little valued (between 1 and 3).
- From the highly relevant enablers, the financial and governance are a 25% each other, whilst the technical account for 50% (Figure 6).

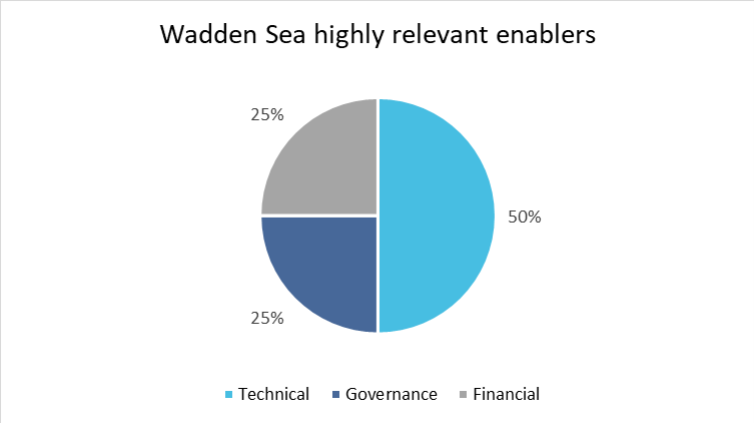

Figure 6. Highly relevant technical, governance and financial enablers in the Wadden Sea pilot site.

Frequency of the enablers

The value of the frequency of the enablers is between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 4 highly relevant enablers), 50% (n=2) were diagnosed as highly frequent, facilitating the development of restoration in the Wadden Sea Pilot. Those are the most relevant and frequent:

- "Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)".
- "Willingness to promote restoration among SHs".

Relevance and frequency of the enablers

Considering the most relevant and frequent enabler in the Wadden Sea Pilot (scored with a value of 5 in relevance and frequency), the technical enabler "**advanced forecasting models that support connectivity restoration** (e.g., sediment transport modelling)" was the most important (see Table 7).

The following table (Table 7) contains the list of all the enablers identified by the Wadden Sea Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Wadden Sea Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the enabler above (scored with a value of 5 in relevance and frequency), the "advanced forecasting models that support connectivity restoration" and closer to the REST-COAST average in terms of relevance (SD 0.7), and slightly further from the global average in terms of frequency (SD of 1.1). It is also worth to highlight higher deviations for other enablers in this Pilot that were less aligned with the REST-COAST global trends, such as the "**innovative value-capture instruments and business models**" which was perceived as less relevant for the Wadden Sea Pilot, compared to the rest of the Pilots in the project (SD 1.6).

Table 7

Ranking of the total enablers for coastal restoration upscaling identified by the Wadden Sea Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 pilot sites of the project as well as the standard deviation of the Wadden Sea Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Wadden Sea pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Wadden Sea pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD Frequency REST-COAST
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	5	4.0	0.7	5	3.4	1.1
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	4	3.9	0.1	5	3.8	0.9
Financial enablers	General enablers	Increasing restoration funding	4	3.4	0.4	3	2.6	0.3
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	4	3.2	0.5	2	2.3	0.2
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	3	3.3	0.2	4	3.1	0.6
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	3	3.2	0.2	3	2.3	0.5
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	3	3.4	0.3	3	2.7	0.2
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	3	2.7	0.2	3	2.8	0.2
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with	3	2.8	0.2	1	2.2	0.9

		socioeconomic and climatic conditions)						
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	2	2.9	0.6	1	2.6	1.1
Technical enablers	General enablers	Proactive maintenance with performance indicators	2	3.2	0.9	1	2.4	1.0
Financial enablers	General enablers	Innovative value-capture instruments and business models	1	3.2	1.6	1	2.9	1.3
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	1	2.6	1.1	1	2.7	1.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of enablers according to these parameters and detect the enablers which are priority to become an opportunity to promote coastal restoration upscaling in the Wadden Sea pilot site (Figure 7). In the upper right quadrant, the technical enablers with the highest score were collected. The "**advanced forecasting models**" followed by "**willingness to promote restoration among stakeholders**" are the enablers identified as most relevant and most frequent.

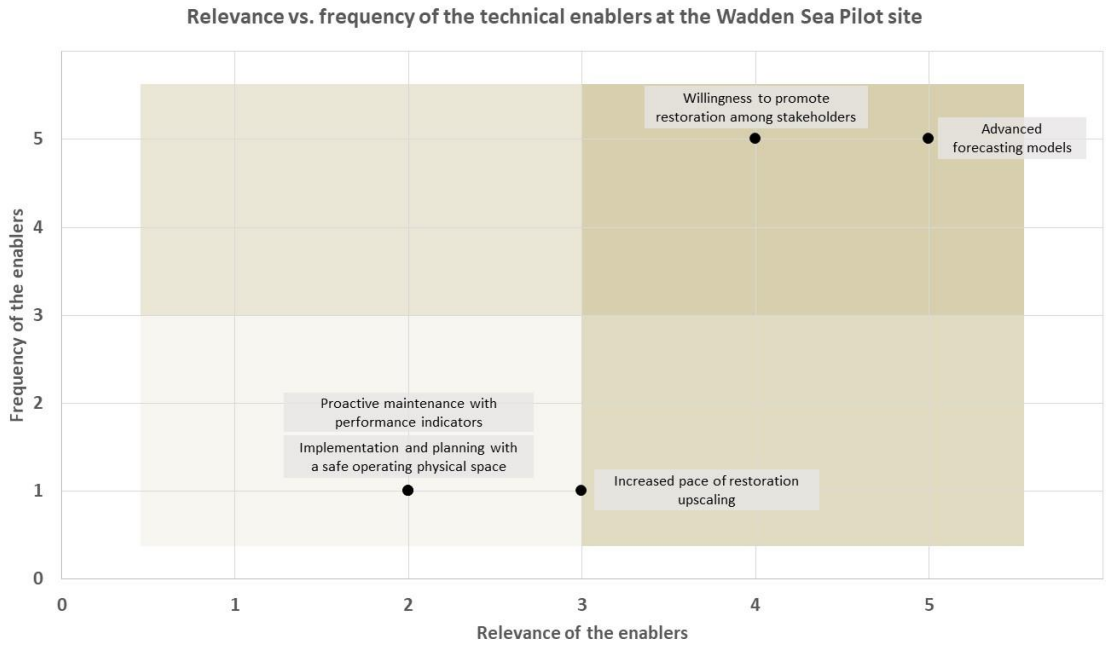

Figure 7. Relevance and frequency of the technical enablers at the Wadden Sea pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Wadden Sea pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 8). The "**willingness to promote restoration among stakeholders**" and the "**advanced forecasting models that support connectivity restoration** (e.g., sediment transport modelling)" were considered the technical enablers with the highest scores of connections to governance and financial enablers so these are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling.

Table 8
A summary of the total connections (strong and weak) between each of the technical enablers of the Wadden Sea pilot site and governance and financial enablers.

		Wadden Sea Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	Proactive maintenance with performance indicators	Willingness to promote restoration among stakeholders
Governance enablers	STRONG connections	6	0	4	0	8
	WEAK connections	2	5	3	5	1
Financial enablers	STRONG connections	0	0	0	0	0
	WEAK connections	3	3	3	3	3
	Score of STRONG connections between enablers	6	0	4	0	8
	Score of WEAK connections between enablers	5	8	6	8	4
	Total score of connections between enablers	**11**	**8**	**10**	**8**	**12**

7.2.1.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category for coastal restoration in the Wadden Sea Pilot, as well as the main potential enabler**. It is worth noting that in this Pilot, 100% of the SHs that participated in the present analysis belonged to the **Government and Public Administration** and they were more concerned about governance barriers while the Pilot highlighted the importance of the technical barriers.
- In the Wadden Sea Pilot, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. The highest coincidence between the perspectives of both groups was found in the technical and governance barriers and enablers.
- **Most of the highly relevant barriers were technical (67%) according to the Pilot's perspective**, in contrast to governance barriers (33%). In addition, **among the highly relevant barriers, almost half of these (44%) were diagnosed as highly frequent by the Pilot**, always appearing during the development of the restoration in the Wadden Sea Pilot.
- **Considering the most relevant and frequent barriers in the Wadden Sea Pilot**, the most important for the Pilot was the technical barrier "**physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**". On the contrary, other technical barriers, such as "limited engineering and ecological expertise" and "mismatch between socioeconomic needs and restoration works", were more relevant barriers for SHs, detected both by 60% of SHs.

- **The most relevant and frequent technical barriers** were the "**physical context specific of the site**" followed by "difficulties related to management plans" and the "**limited COMBINED knowledge of engineering and ecology/biology**". This last technical barrier was proposed by the Pilot as a complement to those compiled in the forms sent to both groups and it was the technical barrier that had the highest number of connections with other governance and financial barriers, followed by the technical barrier "limited engineering and ecological expertise", which was less relevant and frequent in this pilot site.
- **Half of the highly relevant enablers were technical (50%) and, among the highly relevant enablers, 50% were diagnosed as highly frequent**, facilitating the development of restoration in this Pilot. The technical enabler "**advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)**" was the most important in the Wadden Sea Pilot, these results being consistent with the SHs' perspective, since which was detected by 60% of SHs. The technical enabler "**willingness to promote restoration among stakeholders**", following the previous one in terms of relevance and frequency, was the highest priority enabler for the SHs, since it was detected by 100% of them. At the same time, the two technical enablers mentioned above were those that had the highest score of connections to governance and financial enablers. Thus, they need to be reinforced in this Pilot and the CORE-PLAT as a valuable opportunity for coastal restoration. Furthermore, the financial enabler "**innovative value-capture instruments and business models**" which was perceived as less relevant for the Wadden Sea Pilot, compared to the rest of the Pilots in the project, could be also a valuable opportunity for restoration if the experiences of the other REST-COAST Pilots were integrated into this pilot site.

7.2.2 Ebro Delta Pilot - barriers and enablers local report

7.2.2.1 Pilot context

Pilot regional context[4]

The Ebro Delta is one of the three Core Pilots of the REST-COAST project. To address the restoration actions in the Ebro Delta, it is convenient to distinguish the activities and challenges of fluvial restoration from those of coastal restoration. Firstly, the river context is limited by the historical lack of solid and liquid phases of ecological flow, which has notorious consequences on the sedimentary dynamics of the Delta. However, relevant river SHs have different views on the river ecology and dynamics (e.g., in establishing the ecological flow, setting sediment management strategies, etc.). From this perspective, the support for some restoration actions that could improve the ecological status of the river dynamics is currently being limited by some SHs positions. For instance, regarding those who have competencies in the topic, such as the Spanish Ministry, the *Confederación Hidrográfica del Ebro* (CHE, the Ebro Basin authority) and the Catalan Water Agency, they have different points of view and commitments with river restoration actions, such as the by-pass of sediments, which also hinder decision-making and investments within the framework of the REST-COAST project. The main consequence of the latter is an enormous sediment retention along the reservoirs of the Ebro basin, which causes the regression and subsidence that endangers the region in a context of climate emergency. Secondly, as for the coast, the situation is slightly different. There is no such lack of sediment supply that could affect restoration activities, but other limitations arise, such as the lack of knowledge about the possible sources of sand near to the Ebro Delta coast, the need to map the spaces for sand dumpling with a holistic approach, etc. In addition, soft engineering and hard engineering actions have different levels of support from key SHs especially for coastal defence, sand nourishment and dune restoration. Moreover, there has been a lack of large pilot projects with the aim of restoring sediments and ecological dynamics on the Ebro Delta coast. Thirdly, the restoration actions conducted in some of the coastal lagoons of the Ebro Delta have had a broader technical consensus. In this context, the REST-COAST project is a great opportunity for the area to face local challenges and contribute new resources (economical, technical and social) to restoration up-scaling.

Pilot current situation regarding barriers and enablers for coastal restoration

The presence of technical barriers, as well as governance and financial barriers, created problems in the past, with governance traditionally perceived as the most relevant and frequent barrier in this pilot site. However, today different initiatives are being promoted at different levels to address, adapt and mitigate them. The local CORE-PLAT has also proven to be a relevant forum to discuss, anticipate problems and boost restoration activities.

The CORE-PLAT Status

CORE-PLAT members

Eleven SHs were preliminarily identified in this pilot site, both at a local and a national level (see M1.3). The Ebro Delta CORE-PLAT was designed in the following two main levels. On the one hand, the CORE-PLAT fostered a small institutional decision-making group to discuss at the executive level and reach operational consensus in the Pilot. As highlighted in M1.3, a total of seven SHs were contacted and engaged to constitute the executive CORE-PLAT of the Ebro Delta Pilot, including the pre-existing consensus board (*Taula de Consens*)

[4] The following information has been gathered from the Pilots' contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

that involves various actors from the territory (e.g., municipalities, irrigation communities, rice farmers, and citizens of the Ebro Delta). On the other hand, the technical proposals resulting from the executive level of the CORE-PLAT would then be shared with a territorialized group, a broad forum connected to the region to discuss, integrate the expectations and inputs from the locals and co-create the proposed actions.

The Ebro Delta CORE-PLAT (Figure 8) was constituted by four public government bodies and public administration (57%), being the dominant group. Some entities from the third sector (29%), such as a bird protection organization and a private foundation which owns part of the land where the restoration actions will be carried out, also participate in the platform. Finally, local companies and professional committees represent a low proportion in the CORE-PLAT (14%), but it is highly representative, since the actor involved is the pre-existent consensus board integrates various actors of the territory.

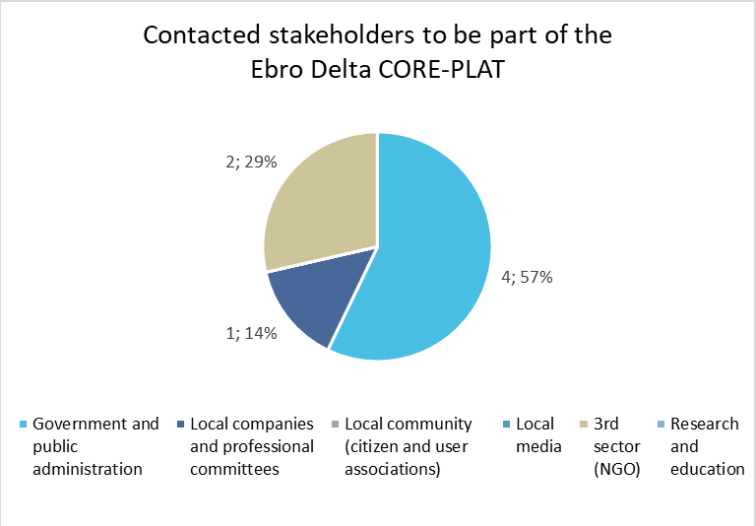

Figure 8. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Ebro Delta Pilot in November 2022 (information retrieved and adapted from the M 1.3).

Developed activities[5]

The following section contemplates the state of the CORE-PLAT in the context of the Ebro Delta. A first workshop for the CORE-PLAT was held in January 2023, involving local SHs. The kick-off meeting counted on the technical and political decision and policymakers, who participated expressing their goals and intentions in relation to the restoration and management actions of the Ebro Delta. Thus, the aim of this first meeting was to launch the platform and explain in depth the REST-COAST project and the CORE-PLAT to generate a discussion among the partners involved on how to make the CORE-PLAT a useful and dynamic space to tackle the restoration challenges. At this meeting, SHs informally discussed how to deal with barriers and enablers for coastal restoration projects, but this was not explicitly addressed. In addition, the SHs participating in this first CORE-PLAT session highlighted the relevance of participation in decision-making and presented some of the specific challenges of the Ebro Delta area. As a potential solution, more efforts should be invested to insist on the need to co-design and create projects aimed at addressing restoration barriers, while fostering enablers among partners. The CORE-PLAT kick-off created a good environment to discuss, anticipate possible conflicts and exchange different expectations while trying to build a greater consensus and alignment of scopes. Therefore, it is essential to continue promoting a new governance model to converge on priorities and co-determine strategies to make restoration, conservation, and management efforts effective.

[5]The information has been gathered for a preliminary understanding of the Pilot' state of art, as a knowledge input for the unfolding of D1.2.

7.2.2.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Considering the results of the pre-diagnosis with Pilots**,** the Ebro Delta Pilot was fully operational and did not delve into discussion on barriers and enablers with SHs. However, this topic was informally discussed during the first CORE-PLAT meeting as a relevant precedent.

Key stakeholders' perspectives on barriers and enablers

In the Ebro Delta Pilot, a total of 4 SHs answered the form. They were key SHs for the pilot area, combining public institutions with management competencies (Coastal authority), socioeconomic (Consensus board) and environmental organizations (SEO/BirdLife and the Catalunya La Pedrera Foundation) with a long tradition in the area. Thus, representatives of all the SHs' groups that constitute the Ebro Delta CORE-PLAT participated in the form (Figure 9), with the third sector having the greatest participation (50%).

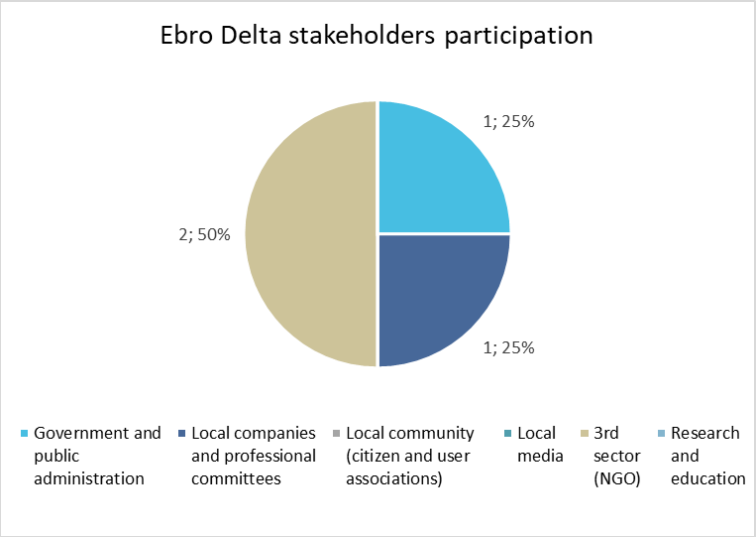

Figure 9. Key local stakeholders of the Ebro Delta Pilot that participated in the form.

On average, the SHs of the Ebro Delta stated that they feel comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 4 on five-point scale). This positive perception can be considered as an “enabler”, as it could enhance the discussion within the framework of the REST-COAST project, as was also seen in the first meeting of the local restoration platform. **Governance was seen by all SHs as the main barrier category for coastal restoration in the Ebro Delta, and the main potential enabler**. They also agreed with the perception of barriers as a relevant factor that hampered coastal restoration efforts in the past in the pilot area (average score is 4.25 on a five-point scale). However, there was no clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the past in the pilot area (average score is 3.25 on a five-point scale). Considering the historical difficulties of governance and the lack of agreement and investments in the area, this result also points to the SH’s scepticism, which highlights the challenge of governance and should be considered for future restoration actions.

7.2.2.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Ebro Delta in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritized according to the relevance and the frequency determined by the Ebro Delta Pilot. Finally, in the last

part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones, also integrating the new barriers proposed by the Pilot.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Ebro Delta pilot site, by integrating the SHs' perceptions with the Pilot analysis. Both the barriers identified and not identified by the Pilot and the SHs, the percentage of SHs that identified each one of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 9). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 16 of the barriers, which means a high level of alignment between both perspectives (64%), while in 36% of the barriers (n=9), there was no coincidence between the Pilot and SHs.
- 56% (n=9) of the identified barriers by both groups were highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- In 44% (n=7) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

Table 9

Identified and unidentified barriers by the Pilot and SHs in the Ebro Delta pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence barriers. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers						
		Pilot perspective	Stakeholders' perspective					Pilot + SHs perspective
		Ebro Delta Pilot level	Ebro SH1: Local companies and professional committees	Ebro SH2: Government and public administration	Ebro SH3: 3rd sector (NGO)	Ebro SH4: 3rd sector (NGO)	Ebro SHs (%)	Ebro Delta Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)						50%	2
	Lack of data and metrics for biodiversity						-	0
	Lack of data and metrics for ecosystem services, ecological processes and functions						25%	1
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)						-	0
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)						50%	2
	Delayed performance of restoration projects						25%	1
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)						-	0
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)						25%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)						-	0
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)						50%	0
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)						50%	2
	Limitations in coordinated decision making						50%	2
	Lack of social engagement in restoration activities						25%	1
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)						25%	1

	Focus in short term policies						25%	1
	Lack of convergence in stakeholders' interests						50%	2
	Lack of laws and policies engaging conservation, management and restoration of natural environments						25%	1
	Bureaucratic issues or delays in authorising the work or receiving work permits						75%	2
	Dealing with socioeconomic needs						50%	2
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions						50%	2
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)						-	0
	Low SHORT-TERM returns from investments						-	0
	Short term and small-scale bias						-	0
	Business plans bound to local constraints						-	0
	Lack of long-term economic support						50%	2

Highest coincidence

The highest coincidence is shown on the governance barrier of “bureaucratic issues or delays in authorizing the work or receiving work permits”, which gathered 75% of the SHs from all sectors in agreement with the Pilot.

Proposed barriers

The proposed barriers were those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

One of the SHs highlighted the lack of pilot actions to assess which are most appropriate and effective.

Governance

On the one hand, the Ebro Delta Pilot noted the feeling of grievance in the territory due to the opportunities lost in the past and that condition future actions. On the other hand, the SHs group detected the following barriers:

- “It would be a priority to define consensus between governments and actors and act in these areas of consensus; it has been too long ago no progress because of political tactics and lack of agreements”.
- “Lack of clear policies and priorities in the middle/long term”.

Financial

The Ebro Delta Pilot highlighted the “lack of budget for long-term restoration project's assessment” while the SHs identified as barriers the fact that “the resources depend on the state, which does not have a defined or consensus roadmap; as well as the lack of decision and political vision in the middle and long term”.

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the barriers in this Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered “highly relevant barriers” while barriers between 1 and 3 were considered “less relevant barriers”.

- A total of 28 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 17 (61%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 11 (39%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 35% technical and another 35% governance, while 30% were financial barriers (Figure 10).

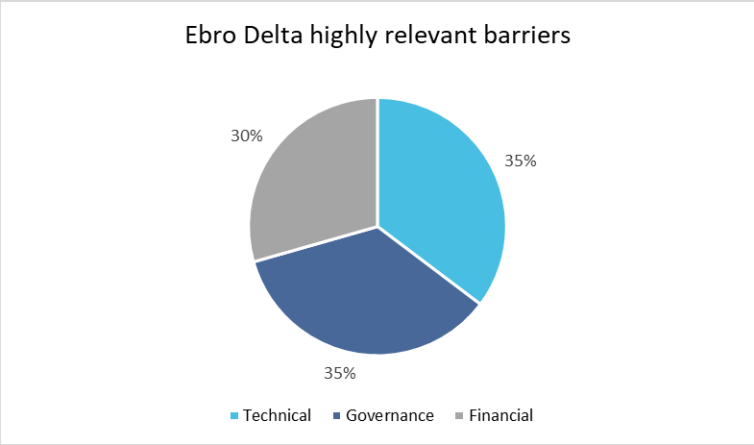

Figure 10. Highly relevant technical, governance and financial barriers in the Ebro Delta pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered “highly frequent” while the barriers scored between 1 and 3 were considered “less frequent”.

From those highly relevant barriers (a total of 17 highly relevant barriers), 59% (n=10) were diagnosed as highly frequent, always appearing while developing restoration in the Ebro Delta Pilot. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area. Those are the most relevant and frequent barriers:

- Difficulties related to management plans.
- Lack of integrated approach.
- Limitations in coordinated decision making.
- Focus on short term policies.
- Lack of long-term economic support.
- Lack of economic resources to invest in restoration actions.
- Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS).
- Lack of convergence in stakeholders' interests.
- Short term and small-scale bias.

- Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders).

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Ebro Delta Pilot (scored with a value of 5 in relevance and frequency), the most important technical barrier in this pilot site was **"the difficulties to management plans** (e.g., plans still to be defined, lack of consensus)", while the three main governance barriers that the Pilot highlighted the most were the "**focus on short-term policies**", the **"limitations in coordinated decision making"** and the "**lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders**)". Finally, the **"lack of long-term economic support"** was the financial barrier that was most relevant and occurred more frequently from the Pilot's perspective (Table 10). If at this point, we also consider the perspective of the SHs who participated in the detection of the barriers analysis, the results show the 50% of SHs coincided with the Pilot in the detection of these barriers mentioned above (see Table 10), which is a fact that also highlights that they are important to this group. Therefore, the technical, governance and financial barriers mentioned above are the barriers which should be established as priority to be addressed in the Ebro Delta Pilot and its CORE-PLAT.

The following table (Table 10) contains the list of all the barriers identified by the Ebro Delta Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Ebro Delta Pilot were compared with the REST-COAST average of each of the barriers. This comparison integrates the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the five previous barriers (scored with a value of 5 in relevance and frequency), the "focus in short term policies" and the "limitations in coordinated decision making" were the barriers that are furthest from the REST-COAST average for relevance (SD 1.2 and 1.1, respectively) and frequency (SD 1.1 and 1, respectively). This deviation for some key governance barriers emphasizes the lack of previous coastal restoration roadmap in the area. On the contrary, this Pilot's score for the financial barrier "lack of long-term economic support" was the closest to the REST-COAST average, for relevance (SD 0.3) and frequency (SD 0.3). It is also worth to highlight higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends, as "**Low benefit-cost ratios (or a lack of cost-benefit evaluation)**", which was a very relevant barrier, but it occurs, or it was perceived to occur, much less frequently in the Ebro Delta (SD 2) than in the overall project consortium. The same is true for "**Low SHORT-TERM returns from investments**" (SD 1.7). Additionally, "**Dealing with socioeconomic needs**" was perceived to be much less relevant for the Ebro Delta Pilot than for the REST-COAST average (SD 1.6) but this was very frequently reported in both scales (SD 0.4). Finally, the technical barrier "**Delayed performance of restoration projects**" was agreed as not relevant but notable for its higher frequency in the Ebro Delta Pilot compared to the rest of the Pilots in the project (SD 1.7).

Table 10

Ranking of the total barriers for coastal restoration upscaling identified by the Ebro Delta Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project, as well as the standard deviation of the Ebro Delta Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Ebro Delta pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Ebro Delta pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Governance barriers	General barriers	Focus in short term policies	5	3.3	1.2	5	3.4	1.1
Governance barriers	General barriers	Limitations in coordinated decision making	5	3.4	1.1	5	3.6	1.0
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	5	3.9	0.8
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	5	4.0	0.7	5	4.0	0.7
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	5	3.6	1.0	4	3.4	0.4
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	5	3.7	0.9	3	3.4	0.3
Financial barriers	General barriers	Low SHORT-TERM returns from investments	5	3.9	0.8	1	3.4	1.7
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	5	4.2	0.5	1	3.9	2.0
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	4	2.8	0.9	5	3.1	1.3
Financial barriers	General barriers	Short term and small-scale bias	4	3.8	0.2	5	3.9	0.8
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	4	3.9	0.1	5	4.2	0.5
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	4	3.4	0.4	4	3.4	0.4
Technical barriers	General barriers	Lack of data and metrics for biodiversity	4	3.1	0.6	3	2.8	0.2
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	4	3.1	0.6	3	3.0	0.0
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	4	4.3	0.2	3	3.7	0.5
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	4	2.9	0.8	2	2.2	0.2
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	3	3.0	0.0	5	3.1	1.3
Financial barriers	Proposed barriers	Lack of budget for long-term restoration project's assessment	3	-	-	4	-	-
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	3	2.8	0.2	4	2.9	0.8
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	3	3.1	0.1	4	3.6	0.3
Governance barriers	Proposed barriers	Feeling of grievance in the territory for opportunities lost in the past and that conditions future actions	3	-	-	3	-	-
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	3	2.6	0.3	2	1.9	0.1
Technical barriers	Further barriers	Acute degradation level and divergence in target state	3	3.4	0.3	2	3.6	1.1
Governance barriers	General barriers	Dealing with socioeconomic needs	2	4.2	1.6	5	4.2	0.5
Technical barriers	General barriers	Delayed performance of restoration projects	2	2.6	0.4	5	2.6	1.7
Governance barriers	General barriers	Lack of social engagement in restoration activities	2	3.3	0.9	3	3.3	0.2
Financial barriers	General barriers	Business plans bound to local constraints	2	3.2	0.9	1	2.9	1.3
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)						
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure						

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, and the distribution of the barriers was represented according to these parameters to detect which barriers should be prioritized in the coastal restoration upscaling in the Ebro Delta pilot site (Figure 11). In the upper right quadrant, the technical barriers with the highest scores were collected. The "**difficulties related to management plans**" and the "**limited engineering and ecological expertise**" were the barriers identified as most relevant and frequent, followed by "**the lack of data and metrics for ecosystem services, ecological processes and functions"**, "**the lack of data and metrics for biodiversity**" and **"the difficulties with monitoring programs"**. It is also worth highlighting the following barriers due to their frequent occurrence, although they were considered less relevant than the previous ones by the Pilot: "the mismatch between socioeconomic needs and restoration works", as well as the "insufficient restoration pace/scale with uncertain benefits and trade-offs". Thus, the important barriers mentioned above (the ones that score the highest both on relevance and frequency) need to be addressed and reinforced in the Ebro Delta CORE-PLAT to generate opportunities and facilitate coastal restoration.

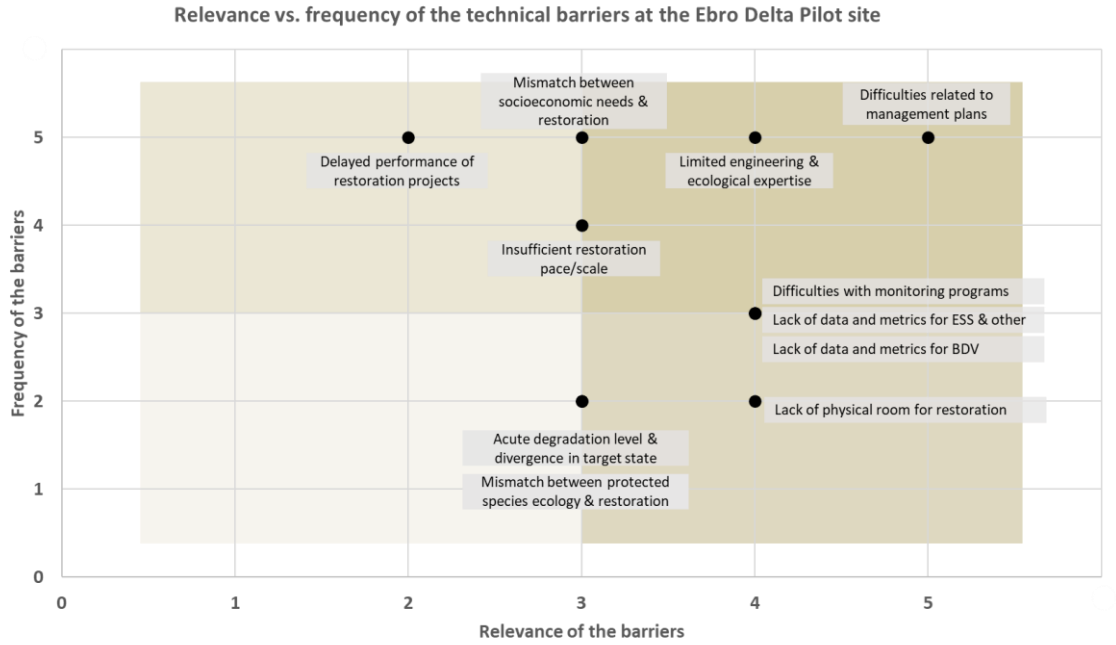

Figure 11. Relevance and frequency of the technical barriers at the Ebro Delta pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Ebro Delta pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 11). Thus, the "**difficulties related to management plans"** was considered the technical barrier that scored highest in terms of connections to governance and financial barriers, followed by the "**insufficient restoration pace/scale with uncertain benefits and trade-offs"**. A greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus,

these barriers should be addressed as a priority, as these may become a stronger impediment to coastal restoration.

Table 11
A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Ebro Delta pilot site.

		Ebro Delta Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	Lack of data and metrics for ecosystem services, ecological processes and functions	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	**Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)**	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	Acute degradation level and divergence in target state	**Insufficient restoration pace/scale with uncertain benefits and trade-offs**	Poor sequencing and limited compatibility with existing infrastructure
GOVERNANCE BARRIERS	**STRONG connections**	2	0	0	0	10	2	4	4	4	4	2	6	2
	WEAK connections	4	2	2	2	3	4	2	4	3	0	4	4	5
FINANCIAL BARRIERS	**STRONG connections**	0	2	2	2	6	4	4	0	0	0	0	6	2
	WEAK connections	5	1	1	1	4	0	0	3	3	2	3	0	2
	Score of STRONG connections between barriers	2	2	2	2	16	6	8	4	4	4	2	12	4
	Score of WEAK connections between barriers	9	3	3	3	7	4	2	7	6	2	7	4	7
	Total score of connections between barriers	**11**	**5**	**5**	**5**	**23**	**10**	**10**	**11**	**10**	**6**	**9**	**16**	**11**

7.2.2.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Ebro Delta Pilot in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritized according to the relevance and the frequency determined by the Ebro Delta Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones, also integrating the new enablers proposed by the Pilot.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Ebro Delta pilot site, by integrating the SHs perceptions with the Pilot analysis (see Table 12):

- The Pilot and the SHs coincided in 10 of the enablers, which represents high proportion (77%), while in 23% of the enablers (n=3), there was no coincidence between the Pilot and SHs.

- 38% (n=5) of the identified enablers were highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- In 38% (n=5) of the enablers, the Pilot coincided with less than 50% of the SHs.

Table 12

Identified and unidentified enablers by the Pilot and SHs in the Ebro Delta pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers						
		Pilot perspective	Stakeholders' perspective					Pilot + SHs perspective
		Ebro Delta Pilot level	Ebro SH1: Local companies and professional committees	Ebro SH2: Government and public admin.	Ebro SH3: 3rd sector (NGO)	Ebro SH4: 3rd sector (NGO)	Ebro SHs (%)	Ebro Delta Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)						75%	2
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)						25%	1
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)						25%	1
	Proactive maintenance with performance indicators						-	0
	Willingness to promote restoration among stakeholders						75%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)						100%	2
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)						25%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)						25%	1
	New plans for transition in governance (promoting participation and sharing the benefits)						25%	1
	Continued training for deeper stakeholder involvement						50%	2
FINANCIAL ENABLERS	Increasing restoration funding						75%	2
	Innovative value-capture instruments and business models						-	0
	Improved capacity to develop business models and bankable plans						-	0

Highest coincidence

- The highest coincidence was on the governance enabler of "**there are multi-level governance mechanisms**", which was identified by 100% of the SHs from all sectors in agreement with the Pilot.
- Other of the highest coincidences were the technical enablers "advanced forecasting models that support connectivity restoration", which was shown by 75% of SHs belonging to NGO'S, the third sector, local companies; and the "willingness to promote restoration among stakeholders", which was agreed by 75% of SHs from all sectors.
- The financial enabler of "increasing restoration funding" was highly perceived by 75% of SHs, belonging to all different sectors.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

The Ebro Delta Pilot proposed the following technical enabler: “the urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives”.

Governance

The Ebro Delta Pilot proposed the “existence of project calls which enable new governance models, based on participation and co-creation approaches”. As for the stakeholder group, one of the NGOs proposed “the Creation of the Climate Resilience Center (CRC)” and highlighted that “the CRC can be a good place to find consensus in decision-making".

Financial

The Pilot proposed “International interest in investing in low cost/effective policies and projects regarding coastal restoration”. For another part, the 25% of the SHs belonging to the third sector proposed the “New green Deal European funds”, as well as “Next generation funds” as financial enablers for coastal restoration upscaling.

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Ebro Delta Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered “highly relevant enablers” while enablers between 1 and 3 were considered “less relevant enablers”.

- A total of 16 enablers were diagnosed and scored, including technical but also financial and governance ones.
- A total of 10 enablers (63%) of those diagnosed were highly relevant (valued between 4 and 5) while 6 enablers (38%) were less relevant (between 1 and 3).
- From the highly relevant enablers, the financial ones were a 40%, technical account for 30%, as well as governance ones (Figure 12).

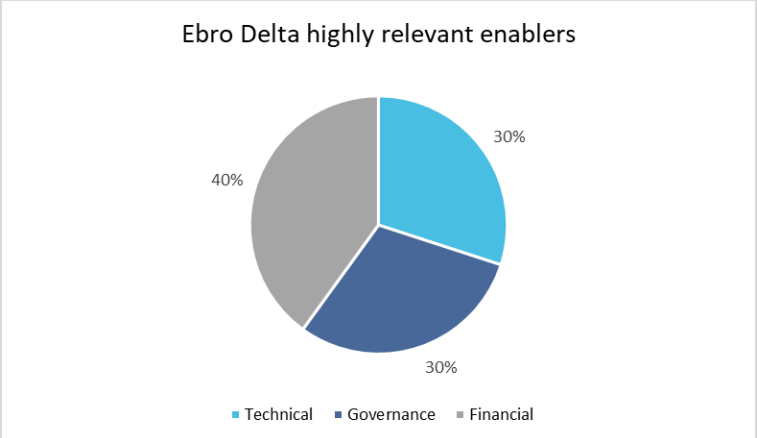

Figure 12. Highly relevant technical, governance and financial enablers in the Ebro Delta pilot site.

Frequency of the enablers

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 10 highly relevant enablers), 80% (n=8) were diagnosed as highly frequent, facilitating the development of restoration in the Ebro Delta Pilot. Those are the most relevant and frequent:

- The urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives (a proposed enabler by the Pilot).
- Existence of project calls which enable new governance models, based on participation and co-creation approaches (a proposed enabler by the Pilot).
- International interest in investing in low cost/effective policies and projects regarding coastal restoration (a proposed enabler by the Pilot).
- Improved capacity to develop business models and bankable plans.
- There are multi-level governance mechanisms (planning at a local level must contribute to national and international regulation).
- New policies towards decarbonized coastal protection (e.g., NBS vs. Grey infrastructure).
- Increasing restoration funding.
- Innovative value-capture instruments and business models.

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Ebro Delta Pilot (scored with a value of 5 in relevance and frequency), the highest priority corresponded to the technical enabler "**the urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives**". While at the governance level was "**the existence of project calls which enable new governance models, based on participation and co-creation approaches**" and at the financial level was "**the international interest in investing in low cost/effective policies and projects regarding coastal restoration**" (see Table 13). All of them were enablers proposed by this Pilot.

The following table (Table 13) contains the list of all the enablers identified by the Ebro Delta Pilot (including their own proposals), ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Ebro Delta Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. As the most relevant and frequent enablers were proposed by the Ebro Delta Pilot, their scores could not be compared with the REST-COAST average to assess these enablers in the global framework of all Pilots. Despite this, these enablers represent valuable opportunities for coastal restoration upscaling in this pilot site. It is worth to highlight the technical enabler "**Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)**" that was perceived as very relevant (SD 0.7) but very rarely takes place in the Ebro Delta, contrasting with the situation in other Pilots (SD 1.7). This can highlight the potential of forecasting as a facilitator in other Pilots, from which lessons can be learned for the Ebro Delta. Also, the "**Willingness to promote restoration among stakeholders**" was contrasting with the REST-COAST average in terms of lower relevance (SD 2.0), that needs to be promoted for the future of co-creation in the Ebro Delta. Accordingly, this comparison showed other three enablers at the bottom of the table that also had lower relevance and frequency values than expected within the

consortium (see Table 13). This may require further discussion in the CORE-PLAT of its likeliness to act as enablers.

Table 13

Ranking of the total enablers for coastal restoration upscaling identified by the Ebro Delta Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Ebro Delta Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Ebro Delta pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Ebro Delta pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	Proposed enablers	The urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives	5	-	-	5	-	-
Governance enablers	Proposed enablers	Existence of project calls which enable new governance models, based on participation and co-creation approaches	5	-	-	5	-	-
Financial enablers	Proposed enablers	International interest in investing in low cost/effective policies and projects regarding coastal restoration	5	-	-	5	-	-
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	5	4.0	0.7	1	3.4	1.7
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	4	2.6	1.0	5	2.7	1.6
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	4	3.3	0.5	4	3.1	0.6
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	4	3.4	0.4	4	2.7	0.9
Financial enablers	General enablers	Increasing restoration funding	4	3.4	0.4	4	2.6	1.0
Financial enablers	General enablers	Innovative value-capture instruments and business models	4	3.2	0.5	4	2.9	0.8
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	4	2.8	0.9	2	2.2	0.2
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	2	2.7	0.5	3	2.8	0.2
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	2	3.2	0.9	1	2.3	0.9
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	1	3.9	2.0	3	3.8	0.5
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	1	2.9	1.3	2	2.6	0.4
Technical enablers	General enablers	Proactive maintenance with performance indicators	1	3.2	1.6	1	2.4	1.0
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	1	3.2	1.6	1	2.3	0.9

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of enablers according to these parameters where detecting which enablers which should be prioritized to become an opportunity for coastal restoration upscaling in the Ebro Delta pilot site (Figure 13). In the upper right quadrant, the technical enablers with the highest score were collected. The technical enabler proposed by the Pilot "**the urgent need for facing and tackling coastal restoration by the growing willingness of social inertia in the territory and international directives**" was scored with the highest relevance and frequency for the Pilot, which should be

addressed and reinforced in the Ebro Delta CORE-PLAT, together with governance and financial enablers proposed by the SHs (see section 7.2.2.4), to generate opportunities to facilitate coastal restoration.

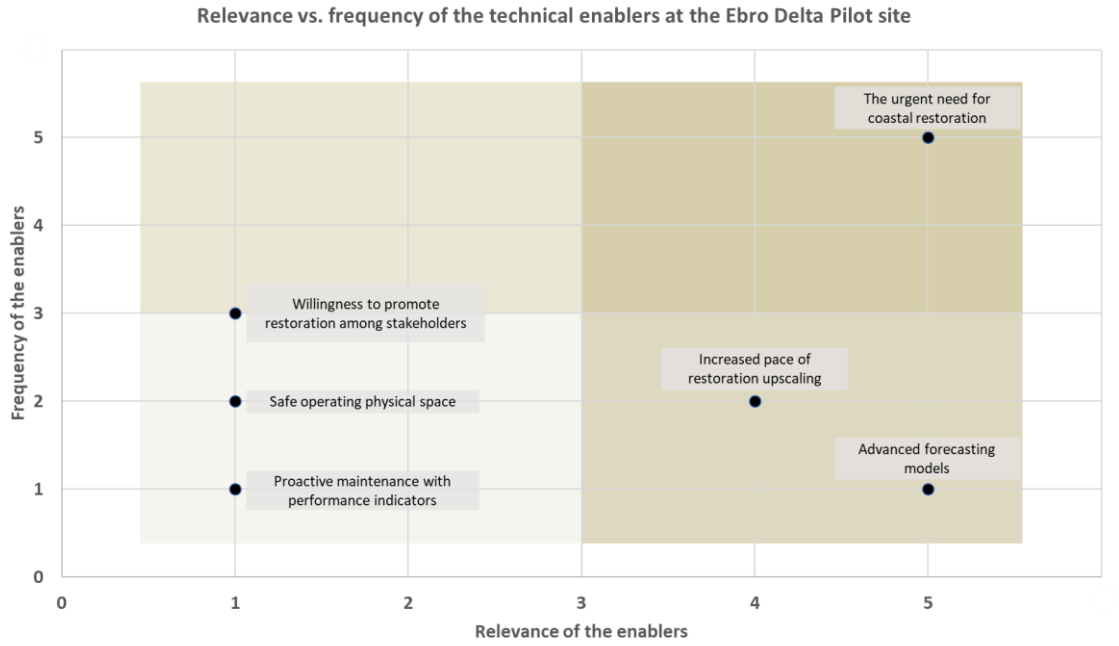

Figure 13. Relevance and frequency of the technical enablers at the Ebro Delta pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.
In this section, there are the results of the connections between the technical with governance and financial enablers related to the Ebro Delta pilot site. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial enablers were determined and "weak connections", scored with 1 (occasional connection) and "strong connections" scored with 2 (frequent connection). In case of no connection between enablers, the score was 0. Secondly, a summary of the total strong and weak connections between technical and financial and governance was compiled in the Table 14. The "**willingness to promote restoration among stakeholders**" and the "**increased pace of restoration upscaling**" were considered the technical enablers which gathered the highest connection scores. Thus, these technical enablers are being amplified with the governance and the financial ones, which emerges as a great opportunity to promote and facilitate the coastal restoration upscaling.

Table 14

A summary of the total connections (strong and weak) between each of the technical enablers of the Ebro Delta pilot site and governance and financial enablers.

		Ebro Delta Pilot					
		TECHNICAL ENABLERS					
		General enablers					Proposed enablers
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	**Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)**	Proactive maintenance with performance indicators	**Willingness to promote restoration among stakeholders**	The urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives
GOVERNANCE ENABLERS	**STRONG connections**	2	0	4	0	6	6
	WEAK connections	1	4	4	3	3	0
FINANCIAL ENABLERS	**STRONG connections**	0	0	2	2	2	2
	WEAK connections	3	2	2	1	2	1
	Score of STRONG connections between enablers	2	0	6	2	8	8
	Score of WEAK connections between enablers	4	6	6	4	5	1
	Total score of connections between enablers	**6**	**6**	**12**	**6**	**13**	9

7.2.2.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category for coastal restoration in the Ebro Delta, and the main potential enabler**. Considering the historical difficulties of governance and the lack of agreements and investments in the area, this result also points to the SH's scepticism, which highlights the challenge of governance and should be considered for future restoration actions.
- At this pilot site, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers for restoration**. In fact, where there was more coincidence between the perspectives of both groups in the barriers and enablers of governance.
- **Among the highly relevant barriers, more than half (59%) were diagnosed as highly frequent**, always appearing while during the development of the restoration in the Ebro Delta Pilot. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area.
- **Considering the most relevant and frequent barriers in the Ebro Delta Pilot, more than half (60%) were governance barriers**, these results being consistent with the SHs' perspective. These barriers were "focus on short-term policies", the "limitations in coordinated decision making" and the "lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)".

- **The most relevant and frequent technical barrier** were the **difficulties related to management plans**, which were also detected by 50% of the SHs and which at the same time had the highest number of connections with governance and financial barriers. Therefore, this barrier should be addressed as a priority in the Ebro Delta Pilot and its CORE-PLAT, as it may become a strong impediment to coastal restoration at this pilot site.
- **Among the highly relevant enablers, 80% were diagnosed as highly frequent**, facilitating the development of restoration in the Ebro Delta Pilot. On the one hand, at a technical level, **the urgent need for tackling restoration** by the growing willingness of social inertia in the territory and the international directives was the most relevant and frequent technical enabler in this Pilot. In contrast, **the willingness to promote restoration among SHs**, which had a low relevance in the Ebro Delta in contrast to the REST-COAST average, was the enabler that had the highest number of connections with governance and financial enablers, and it was detected by 75% of the SHs. Thus, furthering this enabler through the experience of other REST-COAST pilot sites could be a valuable opportunity to facilitate coastal restoration upscaling in the Ebro Delta. On the other hand, at the governance and financial level, the **project calls for new governance models based on participation and co-creation** and the **international interest in investing in low cost and effective policies for coastal restoration** were the most relevant and frequent enablers in this pilot site to be reinforced for coastal restoration.

7.2.3 Venice Lagoon Pilot - barriers and enablers local report

7.2.3.1 Pilot context

Pilot regional context[6]

The Venice lagoon is one of the three Core Pilots of the REST-COAST project. This Pilot is currently the result of anthropic changes that started in the sixteenth century consisting of the diversion of rivers to avoid the sediment supply, the excavation of navigable canals, and the construction of breakwaters at the inlets. Therefore, the lagoon is a unique anthropic ecosystem that requires constant management to maintain its valuable habitats (such as the salt marshes, the mudflats and the seagrass meadows), to contrast the ongoing erosion trend and reverse the sedimentary balance, which is currently negative (loss of sediment towards the sea). However, technical and governance barriers are likely the most relevant in the Venice lagoon, and they are strongly linked. The upscaling restoration plan focuses on active maintenance of eight degraded salt marshes, aiming to accelerate naturalization processes to increase priority habitats and biodiversity. The upscaling restoration plan in the Venice lagoon will consider 103 ha of restored artificial salt marshes.

Pilot current situation regarding barriers and enablers for coastal restoration

The main **technical** issues are related to the large variability and intrinsic complexity of the environment, combined with the difficulties in gathering data, the limited technical and ecological expertise, and the approach to perform mainly large-scale interventions which potentially complicate logistics and site-specific implementation and require large initial investments. Contrasting the various sources of anthropic impacts that threat the Venice lagoon diversity and unique ecosystem requires tailored restoration techniques, and a deep and specialized ecological knowledge that is generally scarce, when it comes to restoration. Additionally, one of the main technical barriers that might complicate the upscaling of restoration are those related to the intrinsic features of the environment. Saltmarshes in the Venice lagoon are often deeply degraded and require interventions, for example by refilling them using huge quantities of a specific typology of sediment which is often unavailable. Furthermore, degraded salt marshes are often placed in inaccessible areas, which makes management activities more complex. Also, shared long-term management plans are often missing or insufficient, and lack the support of accessible data series that would allow for informed interventions. Finally, there is usually a delay in restoration performance which prevents us from assessing the different techniques.

In terms of **governance** barriers, they generally derive from the limited communication and data flows between the different multiple SHs and authorities operating in the Venice Lagoon and the difficulties in developing and implementing shared plans and policies. There are several detrimental human activities that pose a threat to diversity. Additionally, if the importance of restoration is not properly recognized by public and private SHs, this would jeopardize financial support in the long-term.

To sum up, restoration efforts have historically often yielded inconsistent results from an ecological point of view because of the effects of technical, governance and financial barriers. Some of the interventions have been hampered by a lack of knowledge, of technical prowess, or of properly designed scientific monitoring of restoration outcomes, or by a scarcity in long term economic support. Issues in the development, acceptance and implementation of scientifically sound management plans have also represented an important barrier preventing the full success of earlier restoration efforts. The costs and complexity of monitoring and continuous maintenance also made the assessment of restoration performances and their upscaling difficult. Finally, other relevant factors contributing to unsuccessful restoration results are represented by the scarce involvement of different local SHs.

[6] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

The CORE-PLAT Status

CORE-PLAT members

In this pilot site, thirteen SHs were preliminary identified and contacted (see M1.3). As the M1.3 highlighted, a total of seven SHs were contacted and engaged to constitute the executive CORE-PLAT of the Venice Lagoon. These are the following: Marevivo Delegation of the Veneto, Friends of San Giuliano Mestre Park Associations, Lipu/Birdlife Italy, Metropolitan city of Venice, Civil Protection Environment Area, We are here Venice, Il Vento In Tasca aps, and informal environmentalist group CLIMACT, Municipality of Cavallino-Treporti, Town of Venice.

Thus, the Venice Lagoon CORE-PLAT was constituted by various public Government organs and administration (40%), some 3rd sector entities (11%), local companies and professional committees (22%), as well as the local community (16 %) (Figure 14).

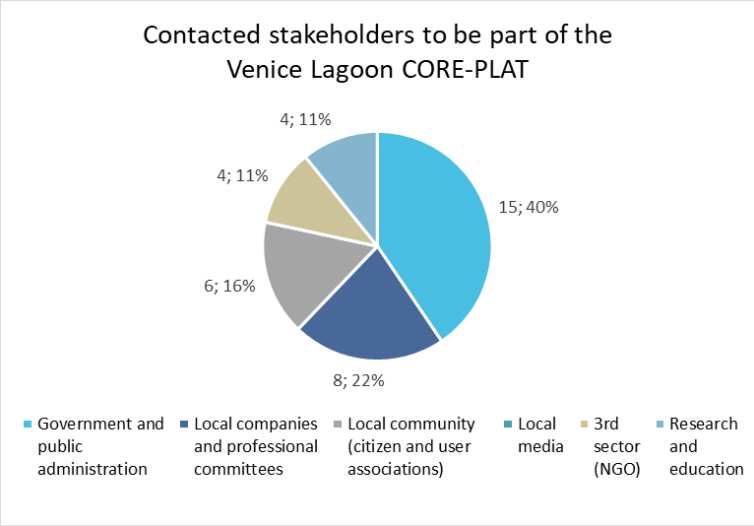

Figure 14. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Venice Lagoon Pilot on November 2022 (Information retrieved and adapted from the M 1.3).

Developed activities[7]

The following section contemplates the status of the CORE-PLAT in the Venice lagoon context. The first SHs meeting was carried out on the 11th of October 2022 at the premises of the Venice Water Authority, which is one of the REST-COAST partners co-leading the Venice pilot together with CORILA and CMCC. Thirteen institutions of the territory were engaged, and it was an opportunity to introduce the REST-COAST project, establishment of the CORE-PLAT and its purpose. The focus was on: “how stakeholders perceive the issues within the lagoon”, “which interventions they think should be prioritized”, “which ESS they identify”, “which NBS they recognize, and think are applied in the lagoon and how they can participate in the restoration processes”. Also, suggestions and indications were collected on how to improve the process of SH’s engagement in planning and managing the works in the lagoon.

7.2.3.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Considering the results of the pre-diagnosis with Pilots, the Venice lagoon Pilot stated the fact that a workshop was held with SHs, including the debate “towards a co-planning of the environmental restoration of the Venice Lagoon”. They also highlighted the fact that they felt comfortable in terms of filling the request on barriers and enablers for coastal restoration with their own information.

[7] The information has been gathered for a preliminary understanding of the pilot’ state of art, as a knowledge input for the unfolding of D1.2

Key stakeholders' perspectives on barriers and enablers

In the Venice Lagoon, the SHs who answered the pre-diagnosis form were all representatives of NGOs, associations or local authorities that are directly or indirectly involved in the preservation of the environment of the Venice lagoon. Thus, some categories deeply connected with the lagoon, their interests and priorities might not be properly represented. An extension of the pool of SHs involved in the project is foreseen and will be an important step towards a better understanding of barriers and enablers for the restoration of the lagoon habitats, encompassing multiple different views. All the responders identified those related to governance and communication between authorities, scientists and SHs as some of the most important barriers for the implementation and upscaling of effective restoration measures in the lagoon.

Indeed, the above-mentioned form was answered by 8 SHs. The respondents represent some of the invited groups: the third sector (63%) as well as the Government and public administration (37%) (see Figure 15).

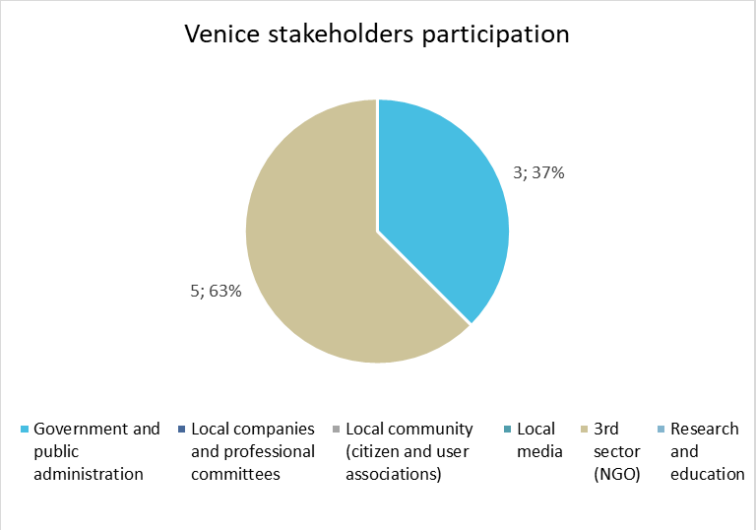

Figure 15. Key local stakeholders of the Venice Lagoon Pilot participated in the form.

On average, the Venice Lagoon claimed to feel somewhat comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 3.25 on five-point scale). This perception might enhance the discussion in the framework of the REST-COAST project. **Governance was seen by all SHs as the main barrier category to coastal restoration in the Venice Lagoon, while the main potential enabler category was technical**. They consistently agree with the perception of barriers as a relevant factor that hampered coastal restoration efforts (average score is 4.43 on a five-point scale). However, there was no clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the pilot area (average score is 3.25 on a five-point scale).

7.2.3.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Venice Lagoon Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritized according to the relevance and the frequency determined by the Venice Lagoon. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of the barriers identified in the Venice Lagoon pilot site, by integrating the SHs' perceptions with the Pilot analysis. Both the barriers identified and not

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identified by the Pilot and the SHs, the percentage of SHs that identified each one of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 15). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 21 of the barriers, which means a higher level of alignment between both perspectives (84%, n=25).
- The barriers in which the most concurrence was shown gathered between 63 and 75% of the SHs attention. These barriers were: "difficulties related to management plans (e.g., plans still to be defined, lack of consensus)", highlighted by the 75% of SHs. Bedsides, the "physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)", "lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)", "negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)" gathered the 63% of the SH's attention.
- In addition, 38% (n=8) of the identified barriers by both groups were highly coincidence. These are the barriers identified by the Pilot and at least 50% of the SHs.
- However, in 62% (n=13) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

Table 15

Identified and unidentified barriers by the Pilot and SHs in the Venice Lagoon pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers										
		Pilot Perspective	Stakeholders Perspective									Pilot + SHs perspective
		Venice Pilot level	Venice SH1: 3rd sector (NGO)	Venice SH2: 3rd sector (NGO)	Venice SH3: 3rd sector (NGO)	Venice SH4: Government and public administration	Venice SH5: 3rd sector (NGO)	Venice SH6: 3rd sector (NGO)	Venice SH7: Government and public administration	Venice SH8: Government and public administration	Venice SHs (%)	Venice Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)										25%	1
	Lack of data and metrics for biodiversity										-	0
	Lack of data and metrics for ecosystem services, ecological processes and functions										-	0
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)										13%	1
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)										75%	2
	Delayed performance of restoration projects										50%	2
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)										38%	1
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)										38%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)										38%	1
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)										63%	2
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)										63%	2
	Limitations in coordinated decision making										50%	2
	Lack of social engagement in restoration activities										50%	2
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)										63%	2

	Focus in short term policies										50%	2
	Lack of convergence in stakeholders' interests										38%	1
	Lack of laws and policies engaging conservation, management and restoration of natural environments										25%	1
	Bureaucratic issues or delays in authorising the work or receiving work permits										38%	1
	Dealing with socioeconomic needs										25%	1
	Lack of economic resources to invest in restoration actions										13%	1
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)											0
FINANCIAL BARRIERS	Low SHORT-TERM returns from investments										25%	1
	Short term and small-scale bias										13%	1
	Business plans bound to local constraints											0
	Lack of long-term economic support										38%	1

Highest coincidence

The highest coincidence is shown on the technical barrier of "difficulties related to management plans (e.g., plans still to be defined, lack of consensus)", with 75% of the SHs from all sectors in agreement with the Pilot.

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

One of the SHs highlighted the "difficulties in governance due to the presence of many entities".

Governance

The group of the SHs from Venice Lagoon Pilot detected the following barriers:

- "Excess of stakeholders making governance difficult and ad hoc and uncoordinated specific projects".
- "A lack of knowledge of the territories on the part of political decision-makers".

Financial

The Venice Lagoon Pilot highlighted the "Lobby of economic activities, community, and regional administrations little attention and the resources wasted and not used correctly (greenwashing), in terms of financial barriers".

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section the information shows quantitative differences between the prioritization of the barriers in this Pilot. As a prioritization criterion, relevance has gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 28 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 20 (71%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 8 (29%) were less relevant (between 1-3).

- The highly relevant barriers were technical (45%), while financial barriers were 30% and the governance were 25% (Figure 16).

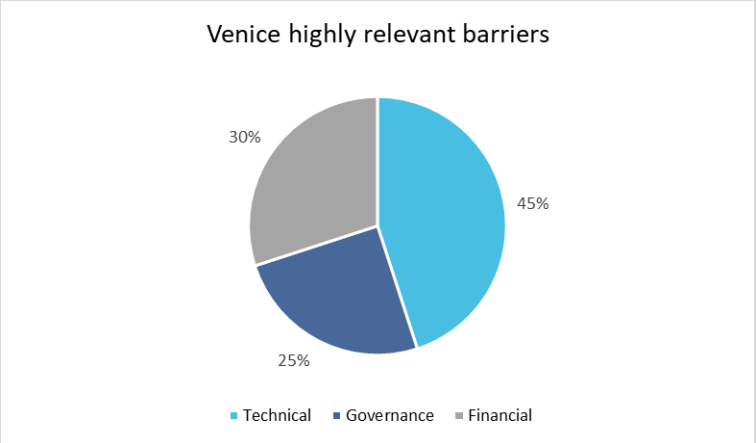

Figure 16. Highly relevant technical, governance and financial barriers in the Venice Lagoon Pilot.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 20 highly relevant barriers), 70% (n=14) were diagnosed as highly frequent, always appearing while developing restoration in the Venice Lagoon Pilot. Those are the most relevant and frequent barriers:

- "Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)".
- "Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)".
- "Acute degradation level and divergence in target state".
- "Low short-term returns from investments".
- "Lack of long-term economic support".
- "Lack of social engagement in restoration activities".
- "Lack of economic resources to invest in restoration actions".
- "Business plans bound to local constraints".
- "Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)".
- "Lack of convergence in stakeholders' interests".
- "Bureaucratic issues or delays in authorizing the work or receiving work permits".
- "Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)".
- "Dealing with socioeconomic needs".
- "Low benefit-cost ratios (or a lack of cost-benefit evaluation)".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Venice Lagoon Pilot (scored with a value of 5 in relevance and frequency), the most important technical barriers in the pilot site were "**difficulties related to management plans** (e.g., plans still to be defined, lack of consensus)", the "**physical context specific of the site** (e.g., terrain typology, watershed, hydrological context, sand availability...)", and the "**acute degradation level and divergence in target state**". Also, the most relevant and frequent financial barriers were "**low**

SHORT-TERM returns from investments" and finally the "**lack of long-term economic support**". Although slightly less frequent, the governance barrier "lack of social engagement in restoration activities", as well as the financial barriers "lack of economic resources to invest in restoration actions" and "business plans bound to local constraints", were also highly relevant barriers which should be a priority too (Table 16). Therefore, the technical, governance and financial barriers mentioned above are the barriers which should be established as priority to be addressed in the Venice Lagoon Pilot and its CORE-PLAT.

The following table (Table 16) contains the list of all the barriers identified by the Venice Lagoon Pilot. They were arranged from along the degree of relevance as well as how frequently the Pilot must deal with them. In addition, the relevance and frequency scores of the Venice Lagoon Pilot were compared with the REST-COAST average of each of the barriers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the five previous barriers above (scored with a value of 5 in relevance and frequency), the technical barrier the "acute degradation level and divergence in target state" is further from the REST-COAST average, for relevance (SD 1.1) and frequency (SD 1.0) than the other barriers. On the contrary, this Pilot's score for the financial barrier "lack of long-term economic support" was the closest to the REST-COAST average, for relevance (SD 0.3) and frequency (SD 0.3). It is also worth to highlight higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends. The "**mismatch between protected species ecology and restoration works**" was scored as highly relevant (SD 1.7) in this Pilot, although the REST-COAST trend is much lighter, this being a less relevant barrier. Also, the technical barrier "**mismatch between socioeconomic needs and restoration works**" was determined as no frequent (SD 1.5) while it is more frequent in the other REST-COAST Pilot. This may require further discussion in the CORE-PLAT.

Table 16

Ranking of the total barriers for coastal restoration upscaling identified by the Venice Lagoon Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Venice Lagoon Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Venice Lagoon pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Venice Lagoon pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	5	4.0	0.7	5	4.0	0.7
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	5	3.8	0.9
Technical barriers	Further barriers	Acute degradation level and divergence in target state	5	3.4	1.1	5	3.6	1.0
Financial barriers	General barriers	Low SHORT-TERM returns from investments	5	3.9	0.8	5	3.4	1.1
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Governance barriers	General barriers	Lack of social engagement in restoration activities	5	3.3	1.2	4	3.3	0.5
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	5	3.6	1.0	4	3.4	0.4
Financial barriers	General barriers	Business plans bound to local constraints	5	3.2	1.3	4	2.9	0.8
Technical barriers	General barriers	Lack of data and metrics for biodiversity	5	3.1	1.3	3	2.8	0.2
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	5	4.3	0.5	3	3.7	0.5
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	3	3.9	0.6
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	5	2.6	1.7	1	1.9	0.6

Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	4	2.8	0.9	5	3.1	1.3
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	4	3.9	0.1	5	4.2	0.5
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	4	3.7	0.2	5	3.4	1.1
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	4	3.1	0.6	4	3.0	0.7
Governance barriers	General barriers	Dealing with socioeconomic needs	4	4.2	0.2	4	4.2	0.2
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	4	4.2	0.2	4	3.9	0.1
Financial barriers	General barriers	Short term and small-scale bias	4	3.8	0.2	3	3.9	0.6
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	4	3.0	0.7	1	3.1	1.5
Technical barriers	General barriers	Delayed performance of restoration projects	3	2.6	0.3	4	2.6	1.0
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	3	3.1	0.1	4	3.6	0.3
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	3	3.0	0.0	4	3.1	0.6
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	3	3.4	0.3	4	3.4	0.4
Governance barriers	General barriers	Focus in short term policies	3	3.3	0.2	2	3.4	1.0
Governance barriers	General barriers	Limitations in coordinated decision making	2	3.4	1.0	2	3.6	1.1
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	2	2.9	0.6	1	2.2	0.9
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	1	2.8	1.3	1	2.9	1.3

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of barriers according to these parameters were detecting which barriers which should be prioritized to become an opportunity for coastal restoration upscaling in the Venice Lagoon pilot site (Figure 17). In the upper right quadrant, the technical barriers with the highest scores were collected, which should be the priority technical barriers to be addressed by the Pilot and the CORE-PLAT. The "**difficulties related to management plans**", "**physical context specific of the site**" and the "**acute degradation level and divergence in target state**" were the barriers identified as most relevant and frequent. They had the greatest relevance for the Pilot and occurred more frequently, which should be addressed and reinforced in the Venice Lagoon CORE-PLAT to facilitate coastal restoration. It is also worth highlighting the following barriers due to their frequent occurrence, although they were considered less relevant than the previous ones by the Pilot: the "limited engineering ecological expertise" and "the difficulties with monitoring programs".

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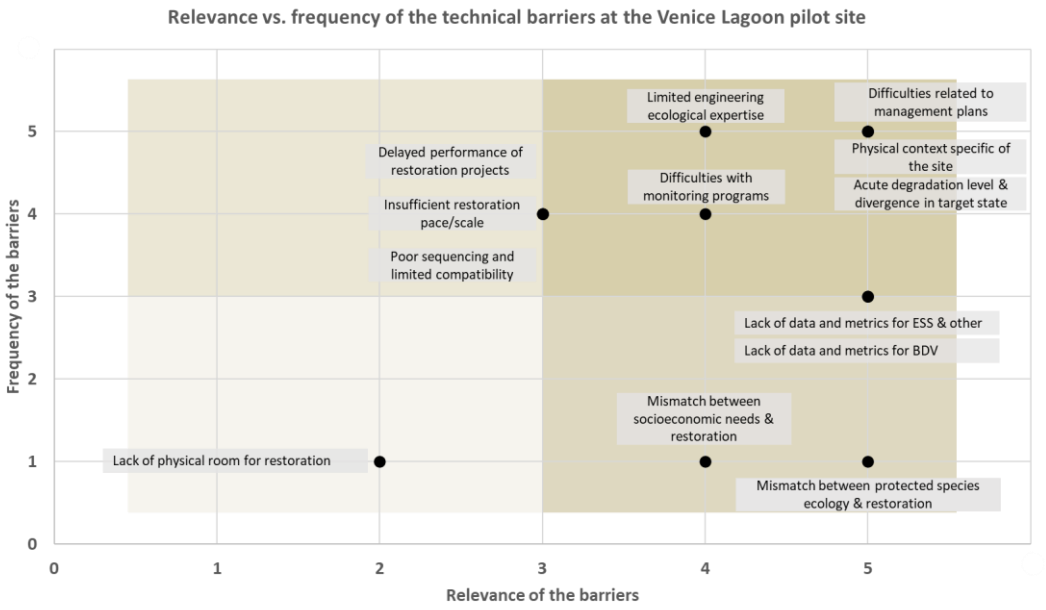

Figure 17. Relevance and frequency of the technical barriers at the Venice Lagoon Pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Venice Lagoon Pilot site with the governance and financial ones were analysed considering the Pilot perspective. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 17). "**Difficulties related to management plans"** were considered the technical barrier that the highest score of connections to governance and financial barriers, followed by "**insufficient restoration pace/scale with uncertain benefits and trade-offs"**. A greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus, these barriers should be addressed as a priority, as these may become a stronger impediment to coastal restoration.

Table 17
A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Venice Lagoon pilot site.

		Venice Lagoon Pilot												
		Technical barriers												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for biodiversity	Lack of data and metrics for ecosystem services, ecological processes and functions	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	**Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)**	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability ...)	Acute degradation level and divergence in target state	**Insufficient restoration pace/scale with uncertain benefits and trade-offs**	Poor sequencing and limited compatibility with existing infrastructure
Governance barriers	**STRONG connections**	8	10	10	0	18	8	2	4	10	6	10	14	18
	WEAK connections	5	4	4	9	0	5	8	7	4	6	4	2	0
Financial barriers	**STRONG connections**	4	4	6	10	10	8	4	0	6	8	8	10	2
	WEAK connections	4	4	3	1	1	2	4	6	3	2	2	1	5
	Score of STRONG connections between barriers	12	14	16	10	26	16	6	4	16	14	18	24	20
	Score of WEAK connections between barriers	9	8	7	10	1	7	12	13	7	8	6	3	5
	Total score of connections between barriers	**21**	**22**	**23**	**20**	**27**	**23**	**18**	**17**	**23**	**22**	**24**	**27**	**25**

7.2.3.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Venice Lagoon in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritized according to the relevance and the frequency determined by the Venice Lagoon Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Venice Lagoon pilot site, by integrating the SHs perceptions with the Pilot analysis (see Table 18):

- The Pilot and the SHs coincided in 13 of the enablers, which represents the highest proportion (100%).
- In addition, 23% (n=3) of the identified enablers were highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- However, in 77% (n=10), the Pilot coincided with less than 50% of the SHs.

Table 18

Identified and unidentified enablers by the Pilot and SHs in the Venice Lagoon pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers										
		Pilot Perspective	Stakeholders Perspective									Pilot + SHs perspective
		Venice Pilot level	Venice SH1: 3rd sector (NGO)	Venice SH2: 3rd sector (NGO)	Venice SH3: 3rd sector (NGO)	Venice SH4: Government and public administration	Venice SH5: 3rd sector (NGO)	Venice SH6: 3rd sector (NGO)	Venice SH7: Government and public administration	Venice SH8: Government and public administration	Venice SHs (%)	Venice Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)										25%	1
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)										13%	1
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)										38%	1
	Proactive maintenance with performance indicators										38%	1
	Willingness to promote restoration among stakeholders										50%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)										50%	2
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)										25%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)										25%	1
	New plans for transition in governance (promoting participation and sharing the benefits)										38%	1
	Continued training for deeper stakeholder involvement										38%	1
FINANCIAL ENABLERS	Increasing restoration funding										50%	2
	Innovative value-capture instruments and business models										38%	1
	Improved capacity to develop business models and bankable plans										25%	1

Highest coincidence

The highest coincidences were on the technical enabler of “willingness to promote restoration among stakeholders”, the governance enabler “there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)” and the financial enabler “increasing restoration funding” perceived by the 50% of the SHs.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Financial

- “The funds are there but they are spent badly”.
- “Funds linked to specific projects”.
- “There have been specific projects over the years, but with the limit of being extemporaneous”.

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Venice Lagoon Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 13 enablers were diagnosed and scored, including technical but also financial and governance ones.
- A total of 10 enablers (77%) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 3 enablers (23%) were less relevant (between 1 and 3).
- From the highly relevant enablers, the technical ones were a 50%, governance account for 30% and financial ones were 20% (Figure 18).

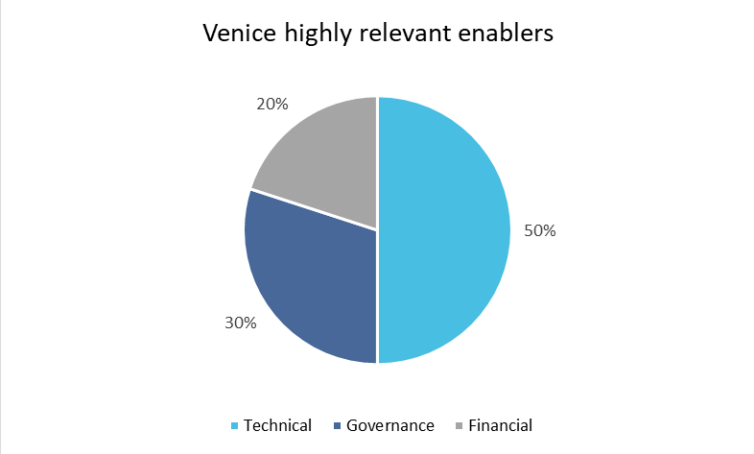

Figure 18. Highly relevant technical, governance and financial enablers in the Venice Lagoon Pilot.

Frequency of the enablers

The value of the frequency of the enablers is between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 10 highly relevant enablers), 20% (n=2) were diagnosed as highly frequent, facilitating the development of restoration in the Venice Lagoon Pilot. Those are the most relevant and frequent:

- "Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)".
- "Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Venice Lagoon Pilot (scored with a value of 5 in relevance and frequency), the highest priority corresponded to the technical enabler "**implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)**" (see Table 19).

The following table (Table 19) contains the list of all the enablers identified by the Venice Lagoon Pilot, ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Venice Lagoon Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the previous enabler is further from the REST-COAST average for relevance (SD 1.5) and frequency (SD 1.0) than other enablers. It is worth to highlight the upper part of the following table (Table 19) in which important differences in relevance were evident when comparing the scores of the Venice Lagoon with the REST-COAST average, such as the "increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)", among others.

Table 19

Ranking of the total enablers for coastal restoration upscaling identified by the Venice Lagoon Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Venice Lagoon Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Venice Lagoon pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Venice Lagoon pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	5	2.9	1.5	4	2.6	1.0
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	5	2.8	1.6	2	2.2	0.2
Technical enablers	General enablers	Proactive maintenance with performance indicators	5	3.2	1.3	2	2.4	0.3
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	5	3.4	1.1	2	2.7	0.5
Financial enablers	General enablers	Increasing restoration funding	5	3.4	1.1	2	2.6	0.4
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	4	4.0	0.0	4	3.4	0.4
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	4	3.9	0.1	3	3.8	0.5
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	4	3.2	0.5	3	2.3	0.5
Financial enablers	General enablers	Innovative value-capture instruments and business models	4	3.2	0.5	3	2.9	0.1
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	4	2.7	0.9	2	2.8	0.5
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	3	3.3	0.2	4	3.1	0.6
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	3	3.2	0.2	2	2.3	0.2
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	3	2.6	0.3	2	2.7	0.5

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of enablers according to these parameters where detecting which enablers which should be prioritized to become an opportunity for coastal restoration upscaling in the Venice Lagoon pilot site (Figure 19). In the upper right quadrant, the technical enablers with the highest score were collected. The technical enabler "**implementation and planning with a safe operating physical space** (i.e., safety from flooding, erosion, etc.)" had the greatest relevance and frequency for the Pilot, which should be addressed and reinforced in the Venice Lagoon CORE-PLAT to generate opportunities to facilitate coastal restoration. The following most relevant technical enablers, which were less relevant than the previous one, were the "advanced forecasting models that support connectivity restoration" as well as the "willingness to promote restoration among stakeholders".

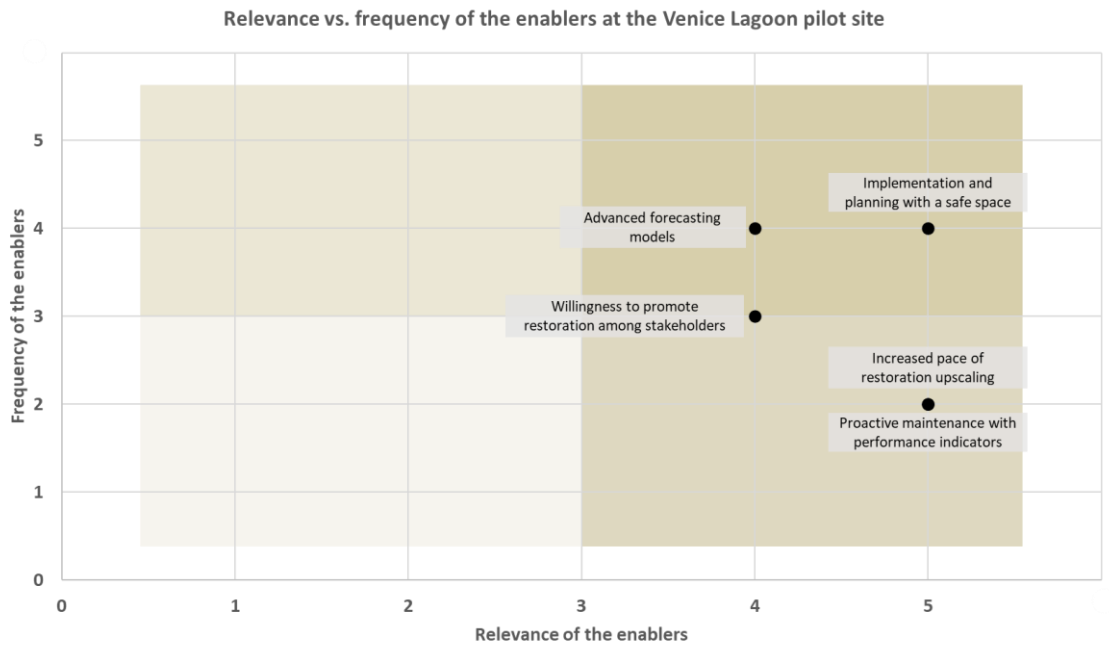

Figure 19. Relevance and frequency of the technical enablers at the Venice Lagoon pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Venice Lagoon pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 20). The "**increased pace of restoration upscaling** (to keep up with socioeconomic and climatic conditions)" and the "**willingness to promote restoration among stakeholders**" were considered the technical enablers with the highest scores of connections to governance and financial enablers so these are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling.

Table 20
A summary of the total connections (strong and weak) between each of the technical enablers of the Venice Lagoon pilot site and governance and financial enablers.

		Venice Lagoon Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	**Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)**	Proactive maintenance with performance indicators	**Willingness to promote restoration among SHs**
Governance enablers	**STRONG connections**	2	10	10	4	10
	WEAK connections	4	0	0	3	0
Financial enablers	**STRONG connections**	4	4	6	6	6
	WEAK connections	1	1	0	0	0
	Score of STRONG connections between enablers	6	14	16	10	16
	Score of WEAK connections between enablers	5	1	0	3	0
	Total score of connections between enablers	**11**	**15**	**16**	**13**	**16**

7.2.3.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category to coastal restoration in the Venice Lagoon, while the main potential enabler category was technical**.
- In the Venice Lagoon pilot site, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. The highest coincidence between the perspectives of both groups was found in the **governance barriers**. The coincidences between the Pilot and the SHs in the case of enablers is more distributed among the different types of enablers.
- **Most of the highly relevant barriers were technical (45%)**, in contrast to financial (30%) and governance (25%) barriers. Furthermore, **among the highly relevant barriers, 70% were diagnosed as highly frequent**, always appearing during the development of the restoration in the Venice Lagoon Pilot.
- Considering the most relevant and frequent barriers in the Venice Lagoon Pilot, **more than half (60%) were technical barriers**.
- **The most relevant and frequent technical barriers** were the "**difficulties related to management plans**", "**physical context specific of the site**" and the "**acute degradation level and divergence in target state**". "**Difficulties related to management plans**" was the technical barrier with the highest number of connections with governance and financial barriers and which in turn was the barrier detected by a greater number of SHs (75%). Therefore, this barrier should be addressed as a priority

in the Venice Lagoon Pilot and its CORE-PLAT, as it has a strong importance in impeding coastal restoration in this pilot site.

- **Most of the highly relevant enablers were technical (50%) and, among the highly relevant enablers, only 20% were diagnosed as highly frequent**, so their relevance may facilitate the restoration in the Venice Lagoon Pilot. On the one hand, the enabler "**implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)**" was the most relevant and frequent technical enabler in this Pilot. In addition, the enablers "**increased pace of restoration upscaling**" and the "**willingness to promote restoration among stakeholders**" were considered the technical enablers with the highest scores of connections to governance and financial enablers. This last technical enabler was also detected by 50% of the SHs. On the other hand, at the governance and financial level, "**new policies towards decarbonised coastal protection** (e.g., NBS vs. Grey infrastructure)" and "**increasing restoration funding**" (also detected by 50% of the SHs), respectively, were highly relevant but they had a low frequency. Thus, reinforcing the frequency of these enablers could be a valuable opportunity to facilitate coastal restoration.

7.2.4 Vistula Lagoon Pilot - barriers and enablers local report

7.2.4.1 Pilot context

Pilot regional context[8]

This pilot site emerged as a by-product of a large infrastructural project: construction of the crosscut from the Baltic Sea to the city of Elbląg. This is the largest city on the southern banks of the Vistula Lagoon, and it is expected to become a vibrant harbour, driving and stimulating the development of the local economy to reverse its decline. Sediment from cutting the passage through the spit and, predominantly from the excavation of a new navigational route to Elbląg harbour is being currently deposited on an artificial island. This is a study object, which is intended to help restore the endangered species in the lagoon, by managing vegetation on the island.

Pilot current situation regarding barriers and enablers for coastal restoration

One of the main issues of the Vistula Lagoon is the fact that, on the one hand, it cannot generate financing neither for pressing socio-economic needs, nor for the restoration of biodiversity. The area needs economic revitalization, and ecology is often not a priority. Long-term economic degradation led to a persisting dependency on external financing and thus resulted in marginal role of local SHs groups. The situation is aggravated by the transboundary character of the Lagoon with divergent legal and administrative systems. On the other hand, revitalization is hardly possible without a clean environment. Therefore, external financing is necessary, usually channelled from the state budget through the Maritime Office. Additionally, the level of expert knowledge is believed to be relatively high, as is managerial experience.

The enablers have not yet boosted restoration activities but are expected do so in the future. They can be synchronized with the management plans for the Vistula Lagoon as a NATURA2000 site for both birds and habitats. Some critical restoration activities should trigger a self-sustaining mechanism, but it is uncertain when this will happen and how large this mechanism will be.

The CORE-PLAT Status

CORE-PLAT members

In this pilot site, one SH was preliminarily identified (see M1.3). Therefore, the CORE-PLAT at Vistula Lagoon is different from other sites, in the sense that it will consist of a single majority but very powerful SH (see Figure 20): the coastal authority agency (Maritime Office in Gdynia MO). They share full jurisdiction in the study area and are the project investor. Thus, they are considered a powerful actor in the field to provide enough information and generate sufficient leverage to engage outside experts. Also, they will be operating the island after its completion. The leaders of the Pilot (Instytut Budownictwa Wodnego) and MO have been cooperating in many research and commercial projects for more than 20 years, so this long history of cooperation is a prerequisite for the success of the CORE-PLAT.

[8] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

Figure 20. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Vistula Lagoon Pilot in November 2022 (Information retrieved and adapted from the M 1.3).

Developed activities[9]

The following section contemplates the status of the CORE-PLAT in the Vistula Lagoon context. The activities that they planned in November 2022 (see Milestone 1.3) were: periodic meetings between IBW and MO, with the aim of establishing permanent contacts between the project partner and the coastal authority and of a follow-up of the CORE-PLAT and its purpose after the project's end. The first meeting was expected to take place in October/November 2022, with the goal of signing the CORE-PLAT declaration), followed by periodic meetings when necessary.

7.2.4.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Regarding the pre-diagnosis form, the Pilot stated the fact that they felt comfortable filling a request on barriers and enablers for coastal restoration in their Pilot case with their own information.

2.2 Key stakeholders' perspectives on barriers and enablers

In the Vistula Lagoon, the form mentioned above was answered by 8 actors, all of them belonging to two major SHs groups, the Research and Education (Institute of Hydroengineering of the Polish Academy of Sciences) and the Government and public administration (Maritime Office in Gdynia) categories (see Figure 21). Some SHs groups were not invited, because they are not involved in restoration activities, mostly because of their economic weakness and the role of the Maritime Office – coastal authority entity, which are supervising the implementation of the NATURA2000 provisions in the Lagoon, and which will be implementing the current and future restoration efforts. A positive side is that the Office has full jurisdiction in the basin, so they can restrict access to restoration sites.

[9] The information has been gathered for a preliminary understanding of the Pilot' state of art, as a knowledge input for the unfolding of D1.2.

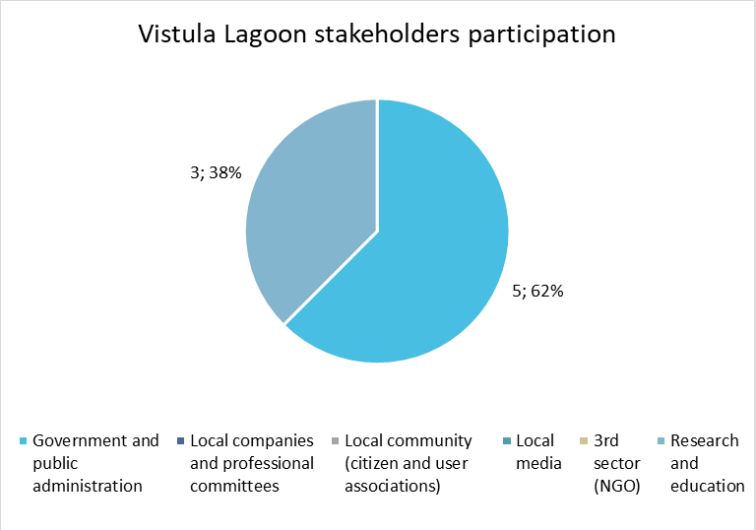

Figure 21. Key local stakeholders of the Vistula Lagoon Pilot that participated in the form.

On average, the Vistula Lagoon pilot claimed to feel comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 3.75 on five-point scale). This perception might enhance the discussion in the framework of the REST-COAST project. **The financial category of barriers was seen by all SHs as the main barrier in the Vistula Lagoon, while the main potential enabler category was also financial**. They lightly agree with the perception of barriers as a relevant factor that has hampered coastal restoration efforts (average score is 3.5 on a five-point scale). However, there is no clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the pilot area (average score is 3 on a five-point scale).

7.2.4.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Vistula Lagoon Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritised according to the relevance and the frequency determined by the Vistula Lagoon Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of identified barriers in the Vistula Lagoon pilot site, by integrating the SHs' perceptions with the Pilot analysis. Both the barriers identified and not identified by the Pilot and the SHs, the percentage of SHs that identified each one of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 21). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 21 of the barriers, which means a high level of alignment between both perspectives (84%).
- 24% (n=5) of the identified barriers by both groups were highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- In 76% (n=16) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

Table 21

Identified and unidentified barriers by the Pilot and SHs in the Vistula Lagoon pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence barriers. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers										
		Pilot perspective	Stakeholders' perspective									Pilot + SHs perspective
		Vistula Pilot level	Vistula SH1: Research & education	Vistula SH2: Research & educatio	Vistula SH3: Research & education	Vistula SH4: Gov- & public admin.	Vistula SH5: Gov- & public admin.	Vistula SH6: Gov. & public admin.	Vistula SH7: Gov- & public admin.	Vistula SH8: Gov. & public admin.	Vistula SHs (%)	Vistula Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)										13%	1
	Lack of data and metrics for biodiversity										25%	1
	Lack of data and metrics for ecosystem services, ecological processes and functions										25%	1
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)										38%	1
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)										25%	1
	Delayed performance of restoration projects										-	0
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)										-	0
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)										25%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)										38%	1
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)										38%	1
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)										50%	2
	Limitations in coordinated decision making										38%	1
	Lack of social engagement in restoration activities										38%	1
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)										50%	2
	Focus in short term policies										13%	1
	Lack of convergence in stakeholders' interests										63%	2
	Lack of laws and policies engaging conservation, management and restoration of natural environments										-	0
	Bureaucratic issues or delays in authorising the work or receiving work permits										25%	1
	Dealing with socioeconomic needs										13%	1
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions										50%	2
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)										25%	1
	Low SHORT-TERM returns from investments										25%	1
	Short term and small-scale bias										38%	1
	Business plans bound to local constraints										-	0
	Lack of long-term economic support										50%	2

Highest coincidence

The highest coincidence was shown on the governance barrier of "Lack of convergence in stakeholders' interests", which gathered 63% of the SHs from all sectors in agreement with the Pilot. The barriers in which the most concurrence was shown gathered 50-63% of the SHs attention.

Proposed barriers

The proposed barriers were those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

One of the SHs highlighted that "restoration of biodiversity in our case depends on the course of the sediment consolidation process on the island so that succession can enter, and the ground stabilizes enough to become stable enough for nesting by birds."

Governance

The group of the SHs from the Vistula Lagoon Pilot detected the following governance barriers:

- "Governance barriers reflect the general economic backwardness of the region".
- "The long-term process of approving protection plans for Natura 2000 sites was and is a limitation. In the case study, however, all activities, ownership rights and responsibility for the island rest with the Maritime Office in Gdynia, and any restrictions will depend on the effectiveness of cooperation with nature protection authorities, considering that the director of the maritime office is the supervisor of marine areas of the Natura 2000 network."

Financial

The Vistula Lagoon Pilot highlighted the following financial barriers:

- "Economic backwardness generates a need for outside financing."
- "The artificial island was created as a side effect of the investment project Construction of a waterway between the Gulf of Gdańsk and the Vistula Lagoon. After the completion of the project, financial outlays will be necessary for the pro-nature development of the island, stimulating succession, mowing or other activities, but these activities will no longer be financed from investment funds, hence possible limitations in the availability of funds. Earlier difficulties were related to limited funds for the development of a draft protection plan for Natura 2000 sites in the Vistula Lagoon and its surroundings. The implementation of these plans also entails significant expenses for the implementation of protective tasks."

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritisation of the barriers in this Pilot. As a prioritisation criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 31 barriers were identified and valued, including technical but also financial and governance ones.

- A total of 16 (52%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 15 (48%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 45% technical and 30% financial, while 25% were governance barriers (Figure 22).

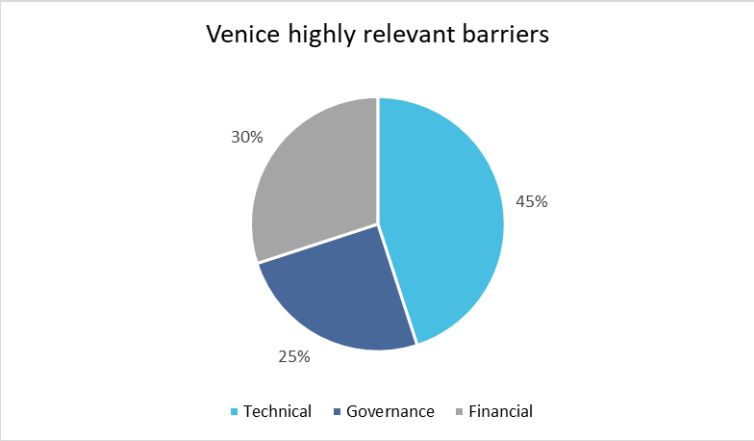

Figure 22. Highly relevant technical, governance and financial barriers in the Vistula Lagoon pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always have to deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 16 highly relevant barriers), 81% (n=13) were diagnosed as highly frequent, always appearing while developing restoration in the Vistula Lagoon Pilot. Those are the most relevant and frequent:

- "Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)".
- "Acute degradation level and divergence in target state".
- "Governance barriers reflect general economic backwardness of the region".
- "Lack of long-term economic support".
- "Economic backwardness generates a need for outside financing".
- "Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)".
- "General long term economic degradation of Vistula Lagoon".
- "Lack of economic resources to invest in restoration actions".
- "Low benefit-cost ratios (or a lack of cost-benefit evaluation)".
- "Low short-term returns from investments".
- "Lack of data and metrics for biodiversity".
- "Insufficient restoration pace/scale with uncertain benefits and trade-offs".
- "Dealing with socioeconomic needs".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Vistula Lagoon Pilot (scored with a value of 5 in relevance and frequency), the two main technical barriers in this pilot site were the **"difficulties to monitoring programs** (e.g., scarce accessibility to wetlands, islands, etc.)", and the "**acute degradation level and divergence in target state"**, while the most important governance barrier that the Pilot highlighted was the "**governance barriers reflect general economic backwardness of the region**." Finally, the **"lack of long-term**

economic support", and the **"economic backwardness generates a need for outside financing"** were the most relevant and frequent financial barriers from the Pilot's perspective (see Table 22).

The following table (Table 22) contains the list of all the barriers identified by the Vistula Lagoon Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Vistula Lagoon Pilot were compared with the REST-COAST average of each of the barriers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the five previous barriers above (scored with a value of 5 in relevance and frequency), the barriers "difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)" and "acute degradation level and divergence in target state", were the barriers that are furthest from the REST-COAST average for relevance (SD 1.3 and 1.1, respectively) and frequency (SD 1.4 and 1, respectively). On the contrary, this Pilot's score for the financial barrier the "lack of long-term economic support" was the closest to the REST-COAST average, for relevance (SD 0.3) and frequency (SD 0.3). It is also worth to highlight higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends, as the "**lack of integrated approach** (i.e. interdisciplinary and coordinated action among stakeholders)" and "**mismatch between socioeconomic needs and restoration works** (e.g. interventions overlapping with bathing season)", which were a very relevant and frequent barrier for the REST-COAST average, but were perceived less frequent (SD 2.0 and 1.5 respectively) and relevant (SD 2.1 and 1.4, respectively) for Vistula Lagoon Pilot.

Table 22

Ranking of the total barriers for coastal restoration upscaling identified by the Vistula Lagoon Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Vistula Lagoon Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Vistula Lagoon pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Vistula Lagoon pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	5	3.1	1.3	5	3.0	1.4
Technical barriers	Further barriers	Acute degradation level and divergence in target state	5	3.4	1.1	5	3.6	1.0
Governance barriers	Proposed barriers	Governance barriers reflect general economic backwardness of the region	5	-	-	5	-	-
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Financial barriers	Proposed barriers	Economic backwardness generates a need for outside financing	5	-	-	5	-	-
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	4	3.8	0.2
Technical barriers	Proposed barriers	General long term economic degradation of Vistula Lagoon	5	-	-	4	-	-
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	5	3.6	1.0	4	3.4	0.4
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	5	4.2	0.5	4	3.9	0.1
Financial barriers	General barriers	Low SHORT-TERM returns from investments	5	3.9	0.8	4	3.4	0.4
Technical barriers	General barriers	Lack of data and metrics for biodiversity	4	3.1	0.6	4	2.8	0.9
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	4	3.1	0.6	4	3.6	0.3
Governance barriers	General barriers	Dealing with socioeconomic needs	4	4.2	0.2	4	4.2	0.2
Governance barriers	General barriers	Lack of social engagement in restoration activities	4	3.3	0.5	3	3.3	0.2
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	4	3.4	0.4	3	3.4	0.3
Financial barriers	General barriers	Business plans bound to local constraints	4	3.2	0.5	3	2.9	0.1
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	3	4.3	0.9	3	3.7	0.5

Governance barriers	General barriers	Focus in short term policies	3	3.3	0.2	3	3.4	0.3
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	3	3.9	0.6	3	4.2	0.9
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	3	2.8	0.2	3	2.9	0.1
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	3	3.7	0.5	3	3.4	0.3
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	3	4.0	0.7	2	4.0	1.4
Technical barriers	General barriers	Delayed performance of restoration projects	3	2.6	0.3	2	2.6	0.4
Financial barriers	General barriers	Short term and small-scale bias	2	3.8	1.3	3	3.9	0.6
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	2	3.0	0.7	2	3.1	0.8
Governance barriers	General barriers	Limitations in coordinated decision making	2	3.4	1.0	2	3.6	1.1
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	2	2.8	0.5	1	3.1	1.5
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	2	2.9	0.6	1	2.2	0.9
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	1	2.6	1.1	1	1.9	0.6
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	1	3.0	1.4	1	3.1	1.5
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	1	4.0	2.1	1	3.9	2.0

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of barriers according to these parameters to detect which barriers which should be prioritized in the coastal restoration upscaling in the Vistula Lagoon Pilot site (Figure 23). In the upper right quadrant, the technical barriers with the highest score were collected. The "**difficulties with monitoring programs**" and the "**acute degradation level and divergence in target state**" were the barriers identified as most relevant and most frequent, followed by "**physical context specific of the site**" and the "**general long term economic degradation**". It is also worth highlighting the "**Insufficient restoration pace/scale with uncertain benefits and trade-offs**", the "**lack of data and metrics for biodiversity**" and with an intermedium relevance and frequency the "**lack of data and metrics for ecosystem services**".

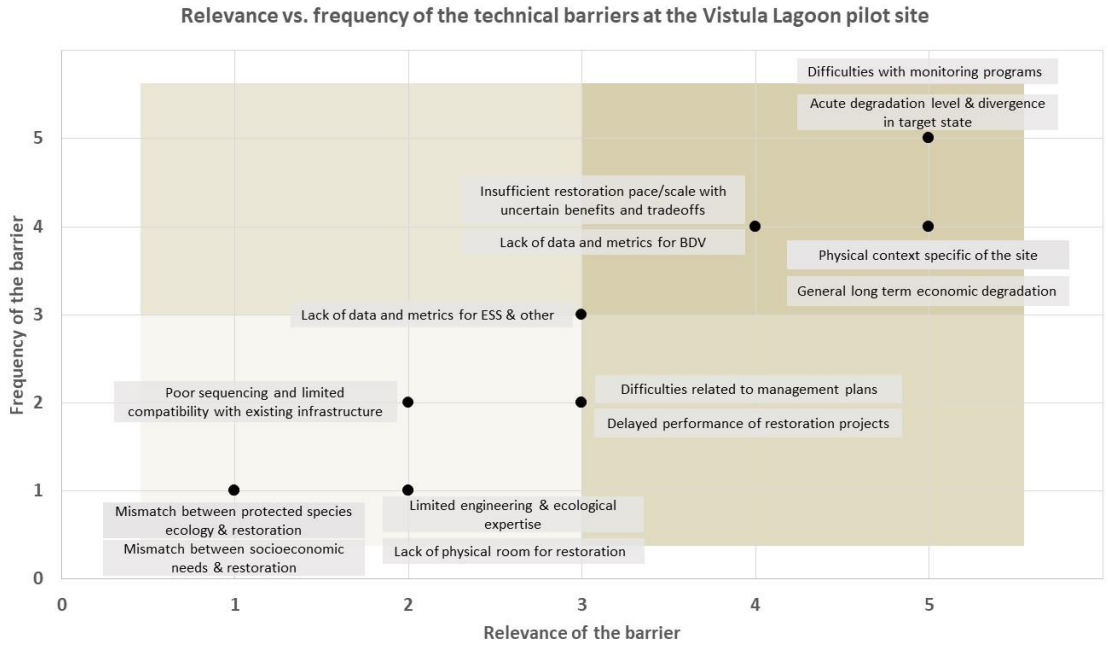

Figure 23. Relevance and frequency of the technical barriers at the Vistula Lagoon pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Vistula Lagoon pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 23). The main technical barrier "**acute degradation level and divergence in target state**" was considered the technical barrier that scored highest in terms of connections to governance and financial barriers, followed by the "**difficulties with monitoring programs**". Therefore, these technical barriers are being affected by other type of linked barriers, which indicates that they should be addressed and prioritised, due to the numerous connections with other types of barriers.

Table 23

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Vistula Lagoon pilot site.

		Vistula Lagoon Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	Lack of data and metrics for ecosystem services, ecological processes and functions	**Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)**	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activitie)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	**Acute degradation level and divergence in target state**	Insufficient restoration pace/scale with uncertain benefits and trade-offs	Poor sequencing and limited compatibility with existing infrastructure
Governance barriers	**STRONG connections**	0	0	0	2	0	0	0	0	0	2	2	0	0
	WEAK connections	0	3	4	1	4	0	0	0	0	1	1	0	0
Financial barriers	**STRONG connections**	0	0	0	6	0	0	0	0	0	6	8	0	0
	WEAK connections	0	0	0	1	0	0	0	0	0	0	0	0	0
	Score of STRONG connections between barriers	0	0	0	8	0	0	0	0	0	8	10	0	0
	Score of WEAK connections between barriers	0	3	4	2	4	0	0	0	0	1	1	0	0
	Total score of connections between barriers	**0**	**3**	**4**	**10**	**4**	**0**	**0**	**0**	**0**	**9**	**11**	**0**	**0**

7.2.4.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Vistula Lagoon in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and the Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritized according to the relevance and the frequency determined by the Vistula Lagoon Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of identified enablers in this pilot site, by integrating the SHs' perceptions with the Pilot one:

- The Pilot and the SHs coincided in 13 of the enablers, which represents the highest proportion (100%).
- In addition, 38% (n=5) of the identified enablers were highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- However, in 62% (n=8) of the enablers, the Pilot coincided with less than 50% of the SHs.

Both enablers identified and not identified by the Pilot and SHs, as well as the percentage of SHs that were identified each of the enablers and the degree of coincidence of the enablers identified by both groups were compiled in the table below (Table 24).

Table 24

Identified and unidentified enablers by the Pilot and SHs in the Vistula Lagoon pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers										
		Pilot perspective	Stakeholders' perspective									Pilot + SHs perspective
		Vistula Pilot level	Vistula SH1: Research and education	Vistula SH2: Research and education	Vistula SH3: Research and education	Vistula SH4: Government and public admin.	Vistula SH5: Government and public admin.	Vistula SH6: Government and public admin.	Vistula SH7: Government and public admin.	Vistula SH8: Government and public admin.	Vistula SHs (%)	Vistula Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)										50%	2
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)										88%	2
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)										13%	1
	Proactive maintenance with performance indicators										13%	1
	Willingness to promote restoration among stakeholders										50%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)										50%	2
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)										25%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)										38%	1

	New plans for transition in governance (promoting participation and sharing the benefits)										13%	1
	Continued training for deeper stakeholder involvement										38%	1
FINANCIAL ENABLERS	Increasing restoration funding										50%	2
	Innovative value-capture instruments and business models										13%	1
	Improved capacity to develop business models and bankable plans										25%	1

Highest coincidence

- The highest coincidence was on the technical enabler of “implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)”, which was identified by 88% of the SHs in agreement with the Pilot.

- For another part, by a coincidence of 50 % of SHs in the following enablers: “advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)”, “willingness to promote restoration among stakeholders”, “there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)”, and the “increasing restoration funding”.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

- “Low population density may become an asset for biodiversity restoration if outside financing is provided through coastal authorities”.
- “The very construction of the island and the emergence of a potential habitat for birds”.

Financial

- “Financing the construction of the island from investment funds”.
- “The use of the investment potential of "construction of the waterway..." to combine the need to deposit spoil with the subsequent use of the island to support biodiversity.”

Governance

- “Responsibility for the island lies in the hands of the Office dealing with the management of the coastal zone, so the case study is based on the most competent institution.”

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Vistula Lagoon Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (relevant). In the analysis, the enablers scored between 4 and 5 were considered “highly relevant enablers” while enablers between 1 and 3 were considered “less relevant enablers”.

- A total of 14 enablers were diagnosed and scored, including technical but also financial and governance ones.
- A total of 4 enablers (29%) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 10 enablers (71%) were less relevant (between 1 and 3).
- From the highly relevant enablers, the technical ones were 75%, and governance account for 25% (Figure 24).

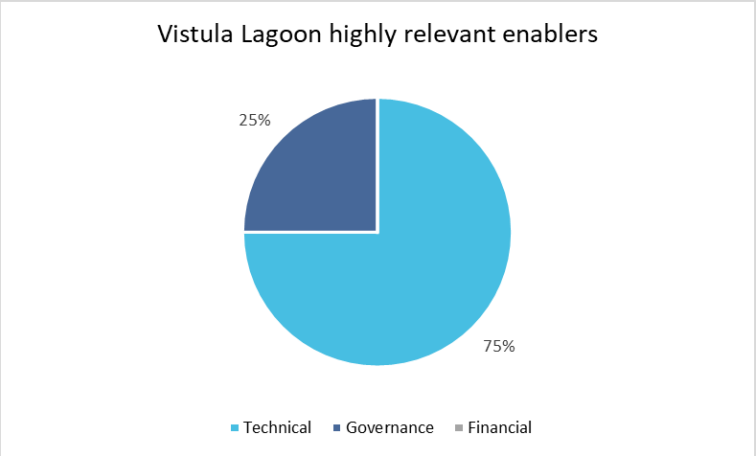

Figure 24. Highly relevant technical, governance and financial enablers in the Vistula Lagoon pilot site.

Frequency of the enablers

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 4 highly relevant enablers), 75% (n=3) were diagnosed as highly frequent. Those are the most relevant and frequent:

- "Low population density may become an asset for biodiversity restoration if outside financing is provided through coastal authorities".
- "Willingness to promote restoration among stakeholders".
- "There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Vistula Lagoon Pilot, the highest priority corresponded to this technical enabler proposed by the Pilot: "**low population density may become an asset for biodiversity restoration if outside financing is provided through coastal authorities**".

The following table (Table 25) contains the list of all the enablers identified by the Vistula Lagoon Pilot (including their own proposals), ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Vistula Lagoon Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. As the most relevant and frequent enabler was proposed by the Vistula Lagoon Pilot, their score could not be compared with the REST-COAST average to assess these enablers in the global framework of all Pilots. Despite this, this enabler represents a valuable opportunity for coastal restoration upscaling in this pilot site. It is also worth to highlight higher deviations for other enablers in this Pilot that were less aligned with the REST-COAST global trends, such as "**Continued**

training for deeper stakeholder involvement", which was a more relevant enabler for the REST-COAST average than Vistula Lagoon Pilot's perception (SD 1.6).

Table 25

Ranking of the total enablers for coastal restoration upscaling identified by the Vistula Lagoon Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Vistula Lagoon Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Vistula Lagoon pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Vistula Lagoon pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	Proposed enablers	Low population density may become an asset for biodiversity restoration if outside financing is provided through coastal authorities	4	-	-	5	-	-
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	4	3.9	0.1	4	3.8	0.2
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	4	3.3	0.5	4	3.1	0.6
Technical enablers	General enablers	Proactive maintenance with performance indicators	4	3.2	0.5	3	2.4	0.4
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	3	4.0	0.7	3	3.4	0.3
Financial enablers	General enablers	Innovative value-capture instruments and business models	3	3.2	0.2	3	2.9	0.1
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	3	2.6	0.3	3	2.7	0.2
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	3	2.9	0.1	1	2.6	1.1
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	2	2.8	0.5	2	2.2	0.2
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	2	3.2	0.9	2	2.3	0.2
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	2	3.4	1.0	2	2.7	0.5
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	2	2.7	0.5	2	2.8	0.5
Financial enablers	General enablers	Increasing restoration funding	2	3.4	1.0	2	2.6	0.4
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	1	3.2	1.6	1	2.3	0.9

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of enablers according to these parameters and detect the enablers which are priority to become an opportunity to promote coastal restoration upscaling in the Vistula Lagoon pilot site (Figure 25). In the upper right quadrant, the technical enablers with the highest score were collected. The proposed technical enabler by the Pilot "**low population density may become an asset for biodiversity restoration**" was the enabler identified as most relevant and frequent, followed by "**willingness to promote restoration among stakeholders**", the "**proactive maintenance with performance indicators**" and the "**advanced forecasting models**".

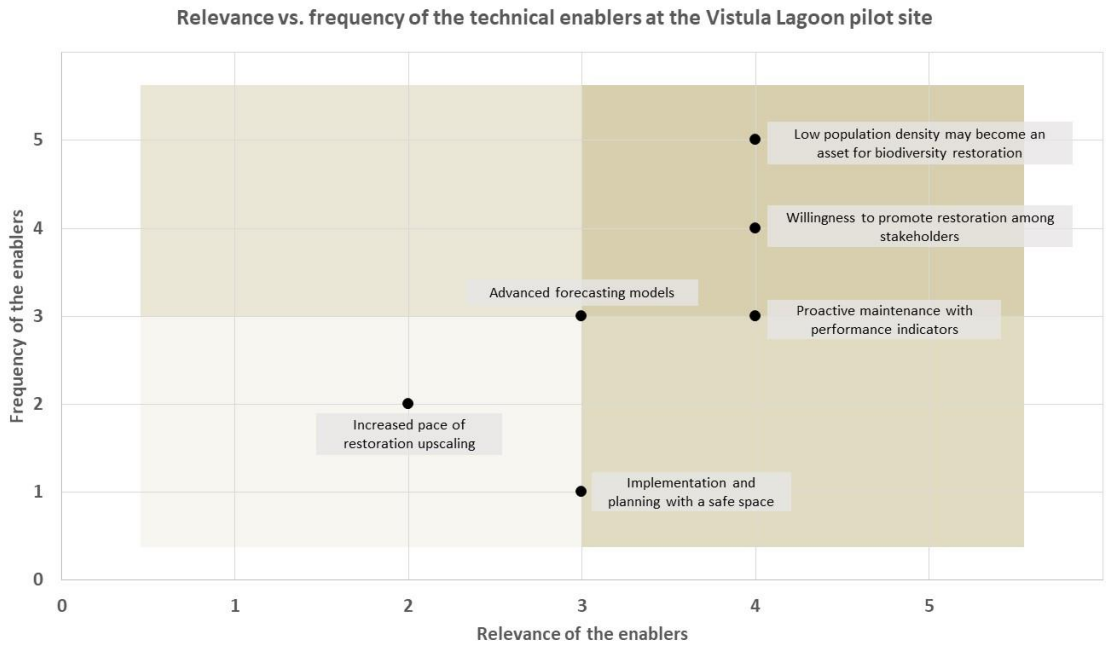

Figure 25. Relevance and frequency of the technical enablers at the Vistula Lagoon pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Vistula Lagoon pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 26). The "**willingness to promote restoration among stakeholders**", the "**advanced forecasting models that support connectivity restoration"** and the "**implementation and planning with a safe operating physical space**" were considered the technical enablers with the highest scores of connections to governance and financial enablers so these are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling.

Table 26
A summary of the total connections (strong and weak) between each of the technical enablers of the Vistula Lagoon pilot site and governance and financial enablers.

		Vistula Lagoon Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	Proactive maintenance with performance indicators	Willingness to promote restoration among stakeholders
Governance enablers	STRONG connections	2	2	0	0	0
	WEAK connections	0	0	0	0	3
Financial enablers	STRONG connections	0	0	0	0	0
	WEAK connections	2	2	0	0	2
	Score of STRONG connections between enablers	2	2	0	0	0
	Score of WEAK connections between enablers	2	2	0	0	5
	Total score of connections between enablers	**4**	**4**	**0**	**0**	**5**

7.2.4.5 Closing remarks

- **The financial category of barriers was seen by all SHs as the main barrier in the Vistula Lagoon, was well as the main potential enabler**. This fits in with the financial conflicts that this Pilot has been trying to address for some time. One of the main issues of the Vistula Lagoon is the fact that it cannot generate financing neither for pressing socio-economic needs, nor for the restoration of biodiversity. Long-term economic degradation led to a persisting dependency on external financing and thus resulted in marginal role of local SHs groups.
- In the Vistula Lagoon pilot site, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration.** The highest coincidences between the perspectives of both groups were found in the governance and financial barriers. As for enablers, the highest alignment between the perspectives of the SHs and the Pilot was found in the technical enablers.
- **Most of the highly relevant barriers were technical (45%)**, in contrast to financial (30%) and governance (25%) barriers. Furthermore, **among the highly relevant barriers, 81% were diagnosed as highly frequent by the Pilot**, always appearing while developing restoration in the Vistula Lagoon Pilot.
- **Considering the most relevant and frequent barriers in the Vistula Lagoon Pilot, 40% of these were technical barriers** such as “difficulties to monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)”, and the “acute degradation level and divergence in target state”; **while another 40% were financial barriers** such as the “economic backwardness generates a need for outside financing” (proposed by the Pilot) and the “lack of long-term economic support”. This last financial barrier was

also relevant for SHs, due to it was detected by 50% of the SHs. In general, the SHs of this Pilot also considered highlighted the presence of governance barriers to coastal restoration upscaling.

- **The most relevant and frequent technical barriers** were the "**difficulties with monitoring programs**" and the "**acute degradation level and divergence in target state**", which in turn had the highest number of connections with governance and financial barriers. Therefore, a greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus, these barriers should be addressed as a priority in the CORE-PLAT, as these may become a stronger impediment to coastal restoration.
- **Most of the highly relevant enablers were technical (75%) and, among the highly relevant enablers, 75% were diagnosed as highly frequent**, facilitating the development of restoration in the Vistula Lagoon Pilot. On the one hand, at a technical level, the proposed technical enabler by the Pilot "**low population density may become an asset for biodiversity restoration**" was the enabler identified as most relevant and frequent, followed by "**willingness to promote restoration among stakeholders**". This last enabler was detected by 50% of the SHs and, in turn, it was one of the enablers that had the highest score of connections to governance and financial enablers. Thus, it is being amplified by other type of enablers and could be a good opportunity to promote and facilitate the coastal restoration upscaling. On the other hand, at the governance level, "**there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)**" was the most relevant and frequent enabler in this pilot site and it was detected by 50% of the SHs, so it should be reinforced for coastal restoration. Also, the "**continued training for deeper stakeholder involvement**" was a more relevant governance enabler in other REST-COAST Pilots than from Vistula Lagoon Pilot's perception, so it could be a valuable opportunity to reinforce in this Pilot considering the experiences of other Pilots.

7.2.5 Foros Bay Pilot - barriers and enablers local report

7.2.5.1 Pilot context

Pilot regional context[10]

This pilot site consists of 58 ha of seagrass meadows. The restoration goal is to restore 17 ha of seagrasses and more than 5 ha of protected reef habitats. The area represents a narrow channel that cuts through a barrier sand bar, thus connecting the eastern part of the lake to the bay. The channel clogging reduces water exchange between the two bodies, hence rending the area highly vulnerable to flooding. The lake is a protected area under the NATURA 2000. This channel rehabilitation would enable "refreshing" of the eastern lake area by means of lower nutrient content coastal bay waters.

Pilot current situation regarding barriers and enablers for coastal restoration

The primary barriers that were highlighted by the Pilot are similar along the entire Bulgarian coastline. These are interconnected, since the financial barriers are linked with lack of scientific studies on local conditions, and the applicability of NBS approaches rather than grey infrastructure, which leads to insufficient engineering and ecological expertise. There has been a lack of emphasis on NBS in coastal waters. As a result, preliminary studies were underfunded (e.g., research on ecological services and functions, which may act as NBS or on mechanisms sustaining not good ecological status in some coastal stretches, etc.). Previously, only small-scale projects were funded, and coastal ecosystem restoration is not a popular concept among the public nor for some decision-makers. Furthermore, there are several management barriers, such as a lack of integrated approach, which leads to limitations in coordinated decision making, and lack of convergence in SHs interests. Together with irregular funding, these led to a focus on short-term and small-scale projects.

Thus, initiatives for coastal restoration may be significantly hindered by technical obstacles, such as the lack of engineering, structural, operational and ecological knowledge. Another significant problem is the absence of relevant planning documents specifically focused on coastal restoration; even though there are existent plans (River Basin Management Plan, Flood Risk Plan, Maritime Spatial Plan etc.), these are generally focused on mitigating the human impact on ecosystems, rather than on direct intervention by restoration.

The CORE-PLAT Status

CORE-PLAT members

In this pilot site, thirteen SHs were preliminary identified and contacted, and five of these were engaged in the first CORE-PLAT meeting (see M1.3). The Foros Bay CORE-PLAT consists of a regional authority belonging to the Ministry of Environment and Waters, the local Maritime Administration, and the local Agency for Fishing and Aquaculture and the Burgas Municipality; also, an oil refinery was involved, which operates in a close area. The municipality is believed to be the only on-board actor with a clearly high potential to affect the objectives of the actions. Several other powerful SHs have not been involved yet, like the District Governor, that is currently in a process of engagement, the Ministry of Environment and Waters. Also, the Underwater Archaeological Centre has a research interest on the site and may oppose to the restoration: any underwater archaeological studies in this area could compromise the Pilot's actions. In this pilot site, the Pilot leaders highlighted their concern regarding the scarce interest of the SHs in the project and the complexities to engage them in the CORE-PLAT. Thus, this issue is considered as one of the main barriers to the platform's good functioning and the accomplishment of the restoration goals.

[10] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

The Foros Bay CORE-PLAT (Figure 26) was constituted by four public government organs and public administration (77%), being the dominant group. Some local companies (15%). Finally, research and education represent a low proportion in the CORE-PLAT (8%).

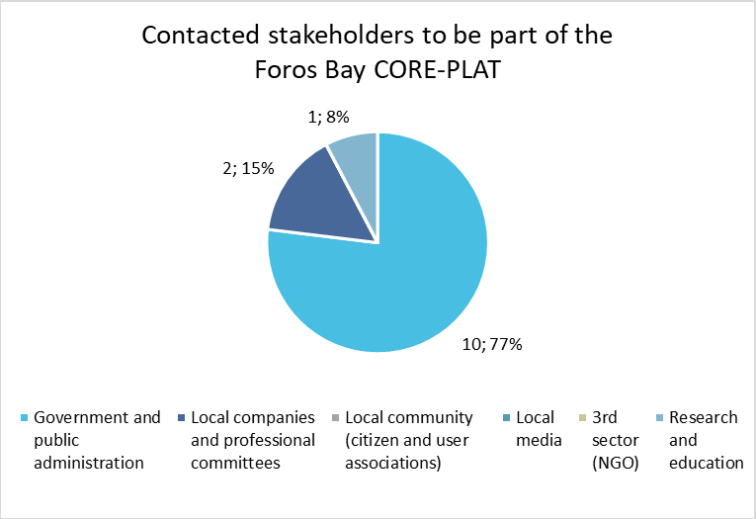

Figure 26. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Foros Bay Pilot in November 2022 (Information retrieved and adapted from the M 1.3).

Developed activities[11]

The following section contemplates the status of the CORE-PLAT in the Foros Bay context. The kick-off meeting of the CORE-PLAT took place in July 2022 with the purpose of presenting the REST-COAST project and aims; however, not all the engaged SHs attended the meeting. Since then, a round table has been organized by the Bulgarian Chamber of Shipping, with the aim to introduce the SHs to the pilot site's environmental issues and the project's tasks. Finally, bilateral meetings have been held from January to December 2023, with the aim to engage the most powerful SHs (which were missing at the kick-off meeting), and to ensure a smooth communication.

7.2.5.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

At the time when the pre-diagnosis form was sent, this Pilot stated that they were planning to discuss the issue of barriers and enablers for coastal restoration projects in their CORE-PLAT in future meetings.

Key stakeholders' perspectives on barriers and enablers

In the Foros bay, the above-mentioned form was answered by 10 SHs. The respondents represent some of the invited groups: the Government and public administration, the research and education and the third sector, NGOs (Figure 27). The research and education group have the greatest participation (50%).

[11] The information has been gathered for a preliminary understanding of the Pilot' state of art, as a knowledge input for the unfolding of D1.2.

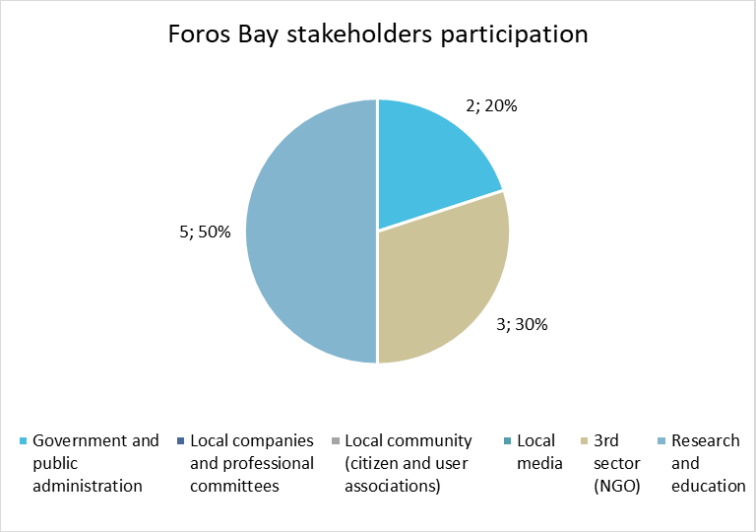

Figure 27. Key local stakeholders of the Foros Bay Pilot that participated in the form.

On average, the Foros Bay claimed to feel comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 3.8 on five-point scale). This positive perception can be considered as an "enabler", as it might enhance the discussion in the framework of the REST-COAST project, as it was also seen in the first local restoration platform meeting. **Governance was seen by all SHs as the main barrier category to coastal restoration in the Foros Bay, while the main potential enabler category was governance as well**. They consistently agree with the perception of barriers as a relevant factor that has hampered coastal restoration efforts (average score is 4.4 on a five-point scale). However, there was no clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the pilot area (average score is 3.4 on a five-point scale).

7.2.5.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Foros Bay Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritised according to the relevance and the frequency determined by the Foros Bay Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Foros Bay pilot site, by integrating the SHs perceptions with the Pilot analysis. Both barriers identified and not identified by the Pilot and SHs, the percentage of SHs that identified each of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 27). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 25 of the barriers, which means the highest level of alignment between both perspectives (100%).
- 68% (n=17) of the identified barriers were highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- However, in 32% (n=8) the Pilot coincided with less than 50% of the SHs.

Table 27

Identified and unidentified barriers by the Pilot and SHs in the Foros Bay pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence barriers. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers												
		Pilot perspective	Stakeholders' perspective											Pilot + SHs perspective
		Foros Bay Pilot level	Foros B. SH1: Research and education	Foros B. SH2: Research and education	Foros B. SH3: 3rd sector (NGO)	Foros B. SH4: 3rd sector (NGO)	Foros B. SH5: Research and education	Foros B. SH6: Research and education	Foros B. SH7: Research and education	Foros B. SH8: 3rd sector (NGO)	Foros B. SH9: Government and public admin.	Foros B. SH10: Government and public admin.	Foros B. SHs (%)	Foros Bay Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)												70%	2
	Lack of data and metrics for biodiversity												40%	1
	Lack of data and metrics for ecosystem services, ecological processes and functions												70%	2
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)												60%	2
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)												70%	2
	Delayed performance of restoration projects												60%	2
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)												10%	1
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)												30%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)												50%	2
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)												30%	1
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)												100%	2
	Limitations in coordinated decision making												60%	2
	Lack of social engagement in restoration activities												80%	2
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)												60%	2
	Focus in short term policies												70%	2
	Lack of convergence in stakeholders' interests												60%	2
	Lack of laws and policies engaging conservation, management and restoration of natural environments												60%	2
	Bureaucratic issues or delays in authorising the work or receiving work permits												50%	2
	Dealing with socioeconomic needs												40%	1
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions												90%	2
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)												10%	1
	Low SHORT-TERM returns from investments												40%	1
	Short term and small-scale bias												70%	2

	Business plans bound to local constraints												20%	1
	Lack of long-term economic support												100%	2

Highest coincidence

The highest coincidence (100%) was shown in the "lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)", and "lack of long-term economic support". This was followed closely by a 90% coincidence in "lack of economic resources to invest in restoration actions".

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

- "Poor awareness among the public and some business organizations".

Governance

- "The lack of coordination of the actions of the various departments"

Financial

An NGO highlighted "the restrictions on applying for projects, lack of a national policy for state co-financing, inconsistency in prioritization in planning/strategic documents with the real need for conservation."

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritisation of the barriers in this Pilot. As a prioritisation criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers is between 1 (no importance) and 5 (relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 26 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 23 (88%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 3 (12%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 43% technical and another 35% governance, while 22% were financial barriers (Figure 28).

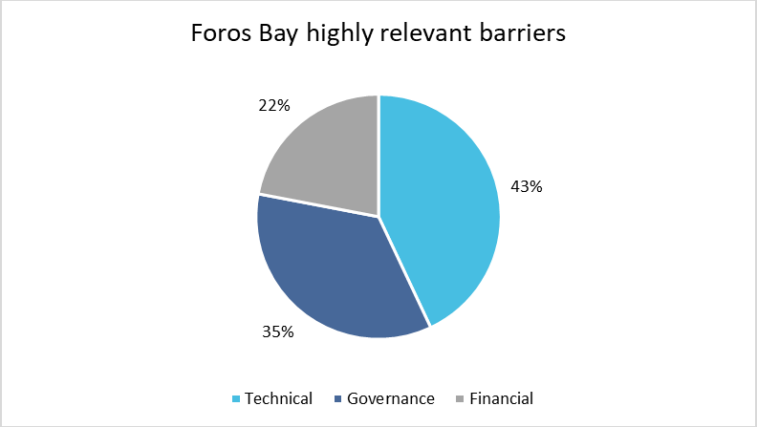

Figure 28. Highly relevant technical, governance and financial barriers in the Foros bay pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always have to deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered “highly frequent” while the barriers scored between 1 and 3 were considered “less frequent”.

From those highly relevant barriers (a total of 23 highly relevant barriers), 100% (n=23) were diagnosed as highly frequent, always appearing while developing restoration in the Foros Bay Pilot. The identification of this combination of relevance and frequency in almost all the restoration barriers may have relevant implications for the future of restoration activities in the area.

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Foros Bay Pilot (scored with a value of 5 in relevance and frequency), it was shown that 17 barriers were found; 6 of which belong to technical, 6 to governance, and 5 to financial (see each of them on the Table 28 Ranking below).

Therefore, the technical, governance and financial barriers shown below are the barriers which should be established as priority to be addressed in the Foros Bay Pilot and its CORE-PLAT. Thus, the following table (Table 28), contains the list of all the barriers identified by the Foros Bay Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot have been dealing with them. This table also includes the averages at the REST-COAST level of each of the barriers to integrate the present Pilot within the global analysis of the 9 pilots of the REST-COAST project. Considering the previous barriers (scored with a value of 5 in relevance and frequency), the “**delayed performance of restoration projects**” and the “**limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)**” were the barriers that are furthest from the REST-COAST average for relevance (SD 1.7 and 1.6, respectively) and frequency (SD 1.7 and 1.3, respectively). On the contrary, this Pilot’s score for the barrier “**lack of long-term economic support**” and "**Dealing with socioeconomic needs**" were the closest to the REST-COAST average, for relevance (SD 0.3 and 0.5, respectively) and frequency (SD 0.3 and 0.5, respectively). It is also worth to highlight higher deviations for other barriers in this Pilot that are less aligned with the REST-COAST global trends, as the “**poor sequencing and limited compatibility with existing infrastructure**” scored as highly relevant, but it is far from the global REST-COAST (SD 1.4). Additionally, for frequency, the “**Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)**” is relatively high from the Pilot, but far for the global REST-COAST (SD 1.5). Accordingly, this comparison showed other barriers at the bottom of the table that also had lower relevance and frequency values than expected within the consortium (see Table XX). This may require further discussion in the CORE-PLAT of its likeliness to act as barriers.

Table 28

Ranking of the total barriers for coastal restoration upscaling identified by the Foros Bay Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Foros Bay Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Foros Bay pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Foros Bay pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	5	4.3	0.5	5	3.7	0.9
Governance barriers	General barriers	Dealing with socioeconomic needs	5	4.2	0.5	5	4.2	0.5
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	5	4.2	0.5	5	3.9	0.8
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	5	4.0	0.7	5	4.0	0.7
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	5	3.9	0.8
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	5	3.9	0.8	5	4.2	0.5
Financial barriers	General barriers	Short term and small-scale bias	5	3.8	0.9	5	3.9	0.8
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	5	3.6	1.0	5	3.4	1.1
Governance barriers	General barriers	Limitations in coordinated decision making	5	3.4	1.1	5	3.6	1.0
Governance barriers	General barriers	Lack of social engagement in restoration activities	5	3.3	1.2	5	3.3	1.2
Governance barriers	General barriers	Focus in short term policies	5	3.3	1.2	5	3.4	1.1
Financial barriers	General barriers	Business plans bound to local constraints	5	3.2	1.3	5	2.9	1.5
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	5	3.1	1.3	5	3.6	1.0
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	5	3.0	1.4	5	3.1	1.3
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	5	2.8	1.6	5	3.1	1.3
Technical barriers	General barriers	Delayed performance of restoration projects	5	2.6	1.7	5	2.6	1.7
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	5	3.0	1.4	4	3.1	0.6
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	4	3.4	0.4	5	3.4	1.1
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	4	4.5	0.4	4	3.8	0.2
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	4	3.7	0.2	4	3.4	0.4
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	4	3.1	0.6	4	3.0	0.7
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	4	2.6	1.0	4	1.9	1.5
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	3	2.8	0.2	3	2.9	0.1
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	2	2.9	0.6	3	2.8	0.2
Technical barriers	General barriers	Lack of data and metrics for biodiversity	2	3.1	0.8	2	2.8	0.5
Financial barriers	General barriers	Low SHORT-TERM returns from investments	-	3.9	-	-	3.4	-
Technical barriers	Further barriers	Acute degradation level and divergence in target state	-	3.4	-	-	3.6	-

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of enablers according to these parameters to detect which enablers which should be prioritized in coastal restoration upscaling at the Foros Bay pilot site (Figure 29). In the upper right quadrant, the technical barriers with the highest score were collected. The "**limited engineering and ecological expertise** (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)", "**lack of data and metrics for ecosystem services, ecological processes and functions**", "**difficulties related to management plans** (e.g., plans still to be defined, lack of consensus)", "**delayed performance of restoration projects**", "**mismatch between socioeconomic needs and restoration works** (e.g., interventions overlapping with bathing season)", and "**insufficient restoration pace/scale with uncertain benefits and trade-offs** " were the barriers identified as most relevant and most frequent, followed by a further barrier of "**poor sequencing and limited compatibility**". It is also worth highlighting the following barriers due to their frequent and relevant occurrence, which are: "**physical context specific of the site**", and "**difficulties related to management plans**", and "**mismatch between socioeconomic needs and restoration**". Finally, for a medium level of frequency and relevance, there is the barrier of "**lack of physical room for restoration**", and the lowest barrier is the "**lack of data and metrics for BDV**". Thus, the previously mentioned important barriers (the ones that score the highest both on relevance and frequency) should be addressed and reinforced in the Foros Bay CORE-PLAT to facilitate coastal restoration.

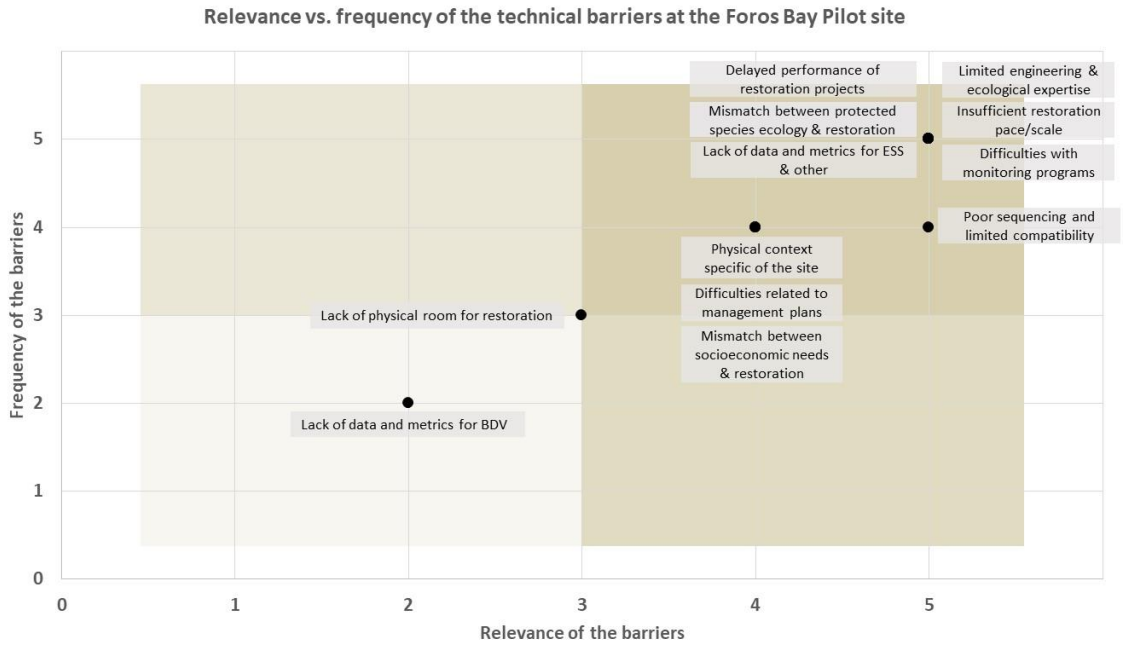

Figure 29. Relevance and frequency of the technical barriers at the Foros Bay pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Foros Bay pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 29). Both the "**delayed performance of restoration projects**", and the "**difficulties related to management plans"** were considered the technical barriers with the highest score of connections to governance and financial barriers,

followed closely by "**lack of data and metrics for ecosystem services, ecological processes and functions**". Therefore, these technical barriers are being affected by other type of linked barriers, which indicates that they should be addressed and prioritised, due to the numerous connections with other types of barriers.

Table 29

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Foros Bay pilot site.

		Foros Bay Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	Lack of data and metrics for ecosystem services, ecological processes and functions	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	**Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)**	**Delayed performance of restoration projects**	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability. ..)	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and trade-offs	Poor sequencing and limited compatibility with existing infrastructure
Governance barriers	**STRONG connections**	12	0	14	0	14	14	0	2	6	0	0	12	14
	WEAK connections	3	3	2	9	2	2	9	8	6	9	0	3	2
Financial barriers	**STRONG connections**	8	0	8	0	10	10	2	0	0	0	0	8	8
	WEAK connections	1	5	1	5	0	0	4	5	5	5	0	1	1
	Score of STRONG connections between barriers	20	0	22	0	24	24	2	2	6	0	0	20	22
	Score of WEAK connections between barriers	4	8	3	14	2	2	13	13	11	14	0	4	3
	Total score of connections between barriers	**24**	**8**	**25**	**14**	**26**	**26**	**15**	**15**	**17**	**14**	**0**	**24**	**25**

7.2.5.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Foros Bay in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritised according to the relevance and the frequency determined by the Foros Bay Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Foros Bay pilot site, by integrating the SHs perceptions with the Pilot analysis (see Table 30):

- The Pilot and the SHs coincided in 13 of the enablers, which represents highest proportion (100%). To have an aligned view on enablers could be a relevant factor to boost the practice of restoration in the area.
- 77% (n=10) of the identified enablers were highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- However, in 23% (n=3) of the enablers, the Pilot coincided with less than 50% of the SHs.

Table 30

Identified and unidentified enablers by the Pilot and SHs in the Foros Bay pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers												
		Pilot perspective	Stakeholders' perspective											Pilot + SHs perspective
		Foros Bay Pilot level	Foros B. SH1: Research and education	Foros B. SH2: Research and education	Foros B. SH3: 3rd sector (NGO)	Foros B. SH4: 3rd sector (NGO)	Foros B. SH5: Research and education	Foros B. SH6: Research and education	Foros B. SH7: Research and education	Foros B. SH8: 3rd sector (NGO)	Foros B. SH9: Government and public admin.	Foros B. SH10: Government and public admin.	Foros B. SHs (%)	Foros Bay Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)												80%	2
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)												70%	2
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)												60%	2
	Proactive maintenance with performance indicators												40%	1
	Willingness to promote restoration among stakeholders												80%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)												40%	1
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)												50%	2
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)												50%	2
	New plans for transition in governance (promoting participation and sharing the benefits)												90%	2
	Continued training for deeper stakeholder involvement												70%	2
FINANCIAL ENABLERS	Increasing restoration funding												80%	2
	Innovative value-capture instruments and business models												70%	2
	Improved capacity to develop business models and bankable plans												20%	1

Highest coincidence

The enablers in which the most concurrence was shown gathered 80-90% of the SH's attention. Those are:

- The highest coincidence was on the governance enabler of "new plans for transition in governance (promoting participation and sharing the benefits)", which was identified by 90% of the SHs from all sectors in agreement with the Pilot.
- Others of the highest coincidences were the technical enablers "advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)" and the "willingness to promote restoration among stakeholders", for another part, the financial enabler "increasing restoration funding ", which were shown by 80% of SHs.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

- "Improved knowledge on both structural and functional relations that exist between different ecological units (e.g., seagrass meadows, macroalgal meadows, coastal wetlands, estuaries, watershed-coastal connectivity etc.)".
- "Improved knowledge on both structural and functional relation that exists within socio-ecological systems. "
- "Improved knowledge and advanced modelling on application of NBS approaches in solving specific ecological problems."
- "Improved knowledge on technical barriers that prevent natural restoration; improved knowledge and experience in NBS solutions."

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Foros Bay Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 16 enablers (N=16) were diagnosed, including technical but also financial and governance ones.
- Only 6% (n=1) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 94% (n=15) were less relevant (between 1 and 3).
- From those the highly relevant, 100% were governance enablers (see Figure 30).

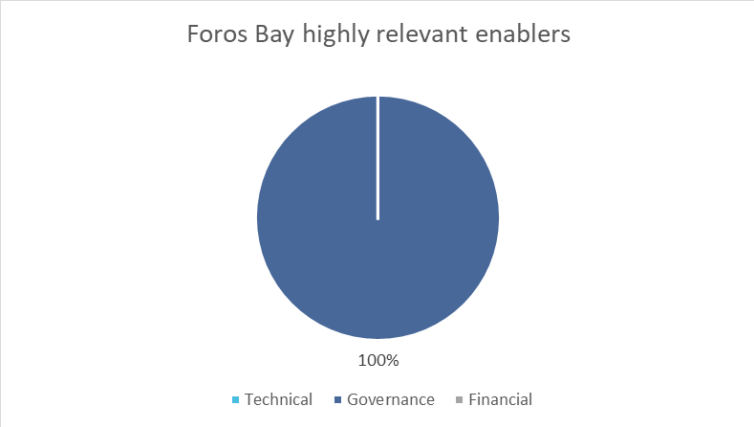

Figure 30. Highly relevant technical, governance and financial enablers in the Foros Bay pilot site.

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Frequency of the enablers

The value of the frequency of the enablers is between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of solely 1 highly relevant enablers), none were diagnosed as highly frequent. The only less frequent from those highly relevant is:

- "There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Foros Bay Pilot (scored with a value of 5 in relevance and frequency), the highest priority at the governance level was "**there are multi-level governance mechanisms** (planification at a local level must contribute to national and international regulation)", whilst the technical and financial ones were not relevant nor frequent (see Table 31).

The following table (Table 31) contains the list of all the enablers identified by the Foros Bay Pilot (including their own proposals), ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Foros Bay Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. It is also worth to highlight higher deviations for other enablers in this Pilot that are less aligned with the REST-COAST global trends, as the "**advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)**", which were more frequently and were generally scored higher in the global consortium than in this Pilot case (SD 1.7). Similarly, the "**willingness to promote restoration among SHs**" was meant to occur more frequently in the global consensus than for this case (SD 2.0). Additionally, "**increasing restoration funding**" was perceived to be much less relevant in the Foros Bay case, than for the REST-COAST average (SD 1.7). This is also true for "**innovative value-capture instruments and business models**" (SD 1.6).

Table 31

Ranking of the total enablers for coastal restoration upscaling identified by the Foros Bay Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Foros Bay Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Foros Bay pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Foros Bay pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	5	3.3	1.2	2	3.1	0.8
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	3	3.2	0.2	1	2.3	0.9
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	2	4.0	1.4	1	3.4	1.7
Technical enablers	General enablers	Proactive maintenance with performance indicators	2	3.2	0.9	1	2.4	1.0
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	2	3.9	1.3	1	3.8	2.0
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	2	3.4	1.0	1	2.7	1.2
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	2	3.2	0.9	1	2.3	0.9
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	1	2.9	1.3	1	2.6	1.1

Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	1	2.8	1.3	1	2.2	0.9
Technical enablers	Proposed enablers	Improved knowledge on both structural and functional relations that exist between different ecological units (e.g., seagrass meadows, macroalgal meadows, coastal wetlands, estuaries, watershed-coastal connectivity etc.)	1	-	-	1	-	-
Technical enablers	Proposed enablers	Improved knowledge on both structural and functional relation that exists within socio-ecological systems	1	-	-	1	-	-
Technical enablers	Proposed enablers	Improved knowledge and advanced modelling on application of NbS approaches in solving specific ecological problems	1	-	-	1	-	-
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	1	2.7	1.2	1	2.8	1.3
Financial enablers	General enablers	Increasing restoration funding	1	3.4	1.7	1	2.6	1.1
Financial enablers	General enablers	Innovative value-capture instruments and business models	1	3.2	1.6	1	2.9	1.3
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	1	2.6	1.1	1	2.7	1.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of enablers according to these parameters to detect the enablers which are priority to become an opportunity to promote coastal restoration upscaling in the Foros Bay pilot site (Figure 31). In the upper right quadrant, the technical enablers with the highest score were collected. For this case, there were not any technical enablers that were highly relevant and frequently. However, the enablers that were scored as medium relevant are: “advanced forecasting models”, “proactive maintenance with performance indicators”, and “willingness to promote restoration among SH”. Additionally, it is worth highlighting the fact that the lowest scores were for “implementation and planning within a safe operating space”, and “increased pace of restoration upscaling”. The previously mentioned enablers that have the greatest relevance for the Pilot and occur more frequently, in this case governance ones, should be addressed in the Foros Bay CORE-PLAT, together with those enablers proposed by the SHs (see section 4.1.3), to generate opportunities to facilitate coastal restoration.

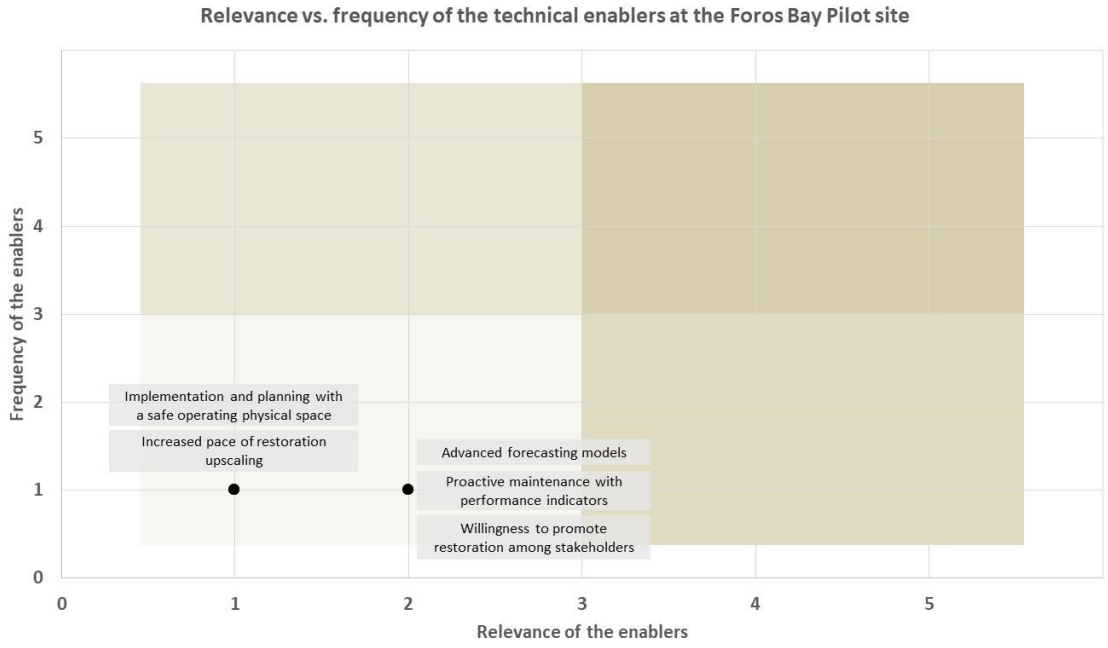

Figure 31. Relevance and frequency of the technical enablers at the Foros Bay Pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical, financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Foros Bay pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot.

For this Pilot, this specific analysis could not be conducted for the enablers section, as they rest-cowed that their technical enablers were not significant neither in value nor in number, especially in terms of low frequency and relevance (see Table 31 and Figure 31 above). Thus, this section has solely conducted previously for the barriers section. For this reason, the enablers were scored (see Table 31), but there was not a further need to interconnect them with financial and governance ones.

7.2.5.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category to coastal restoration in the Foros Bay, as well as the main potential enabler category**.
- At the Foros Bay pilot site, **there was the highest level of agreement (100%) between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. Regarding the barriers, the highest coincidence between the perspectives of both groups was found in the governance barriers. As for the enablers, the highest coincidences between these two groups were found in the technical and governance enablers.
- **Most of the highly relevant barriers were technical (43%) barriers**, in contrast to governance (35%) and financial (22%) ones. In addition, **the percentage of highly relevant barriers is high (88%) in this pilot site**. Moreover, **among the highly relevant barriers, 100% were diagnosed as highly frequent**, always appearing during the development of the restoration in the Foros Bay Pilot. The identification of this combination of relevance and frequency in almost all the restoration barriers may have relevant implications for the future of restoration activities in the area.
- **Considering the most relevant and frequent barriers in the Foros Bay Pilot, 35% were technical barriers, other 35% were governance and 30% were financial ones**.
- Among the highly relevant and frequent barriers, the technical barriers with the highest score of connections to governance and financial barriers were found and are the following: the "**difficulties related to management plans**" and the "**delayed performance of restoration projects**". This last technical barrier is further from the REST-COAST average for relevance and frequency, being less relevant and frequent in other REST-COAST Pilots and from which their experience could be integrated to approach this barrier.
- **All the enablers according to the Foros Bay Pilot perspective were from governance and, among the highly relevant enablers, none were diagnosed as highly frequent**. The highest priority at the governance level was "**there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)**", whilst the technical and financial ones were not relevant nor frequent. On the contrary, the governance enabler detected by a higher number of SHs (90%) was the following: "**new plans for transition in governance (promoting participation and sharing the benefits)**". Therefore, promoting different types of enablers for coastal restoration, as well as fostering connections between enablers is a duty to reinforce in the CORE-PLAT of this Pilot.

7.2.6 Rhone Delta Pilot - barriers and enablers local report

7.2.6.1 Pilot context

Pilot regional context[12]

The restoration actions are planned in the site of the Former Saltworks, which is the south-eastern part of the Rhone delta, an area acquired by the Conservatoire du Littoral between 2008 and 2012. Prior to 2008, this site was devoted to industrial salt production for approximately 50 years. Nevertheless, as salt production was no longer economically viable, the French Coastal Protection Agency acquired the site and, consequently, changes in the management of the site occurred (e.g., the excessive salinization of water, with detrimental effects on plants and animals). It was therefore decided since 2010 to implement a realignment strategy on the site: the sea-dikes protection of the former salt production site is no longer maintained, and the protection effort is now focused on a government owned dike which is located about 7 km inland, resulting in a new 4600 ha "Climate change buffer area" between the former and the inland dikes. Several works have been carried out (opening of dikes, dredging works, etc.) to create connections between the various former salt production basins (North-South red arrow in Figure XX). Hydraulic works have reconnected the site to a nearby agricultural catchment, itself irrigated from the Rhone River, allowing new freshwater flows in the site.

Thus, the restoration goal is to obtain additional 300 ha of coastal lagoons, and 60 ha of Mediterranean halophilous scrubs/Salicornia and other annuals colonising restored mud and sand areas, create new beach areas (short term) and restore as many areas as possible in the 4600-ha buffer zone (long term). There are several actions: passive restoration (based on the elimination of the "historic" seawalls by their non-maintenance), active restoration (targeted and concerted manipulation of all existing hydraulic structures on the site). The last and third action (local upscaling restoration) will be carried out through the targeted and concerted manipulation of all existing hydraulic structures on the site, by fully involving the CORE-PLAT (active restoration).

Pilot current situation regarding barriers and enablers for coastal restoration

As in other REST-COAST Pilots, the barriers have been hampering coastal restoration. In the case of the Rhone Delta, governance barriers play an important role which may hinder effective restoration upscaling. The area concentrates many economic, ecological, and sociological interests, with a multitude of actors. Thus, reaching a consensus on a restoration strategy implies establishing a new governance framework. Due to the large number of issues at stake in these areas, with conflicting interests, it is very difficult to set up this governance system including the largest number of people. Furthermore, particularly in the past, the local population has not been sufficiently included in the governance process, which creates local tensions.

As for enablers, they have been a relevant factor boosting coastal restoration efforts in the past, especially the scientific ones. Scientific knowledge served to boost and justify the relevance of the targeted restoration strategy upstream. The presence of technical as well as governance and financial barriers created problems in the past, but today different initiatives are being promoted at different levels to address, adapt, and mitigate them. The local CORE-PLAT has also proven to be a relevant forum to discuss, anticipate and promote restoration activities.

[12] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

The CORE-PLAT Status

CORE-PLAT members

In this pilot site, a total of 28 SHs were preliminary contacted and engaged to participate and constitute the CORE-PLAT of the Rhone Delta Pilot, including mainly France state services (such as the Camargue Regional Nature Park) as well as some private partners (such as salt production companies) and involved associations (such as the fishers, hunters, bull breeders, nature guides, the Agricultural Watershed Management Association, etc). Thus, the Rhone Delta CORE-PLAT was constituted by various public government organs and administration (46%), some third sector entities (4%), local companies and professional committees (18%), as well as the local community (32 %) (see Figure 32).

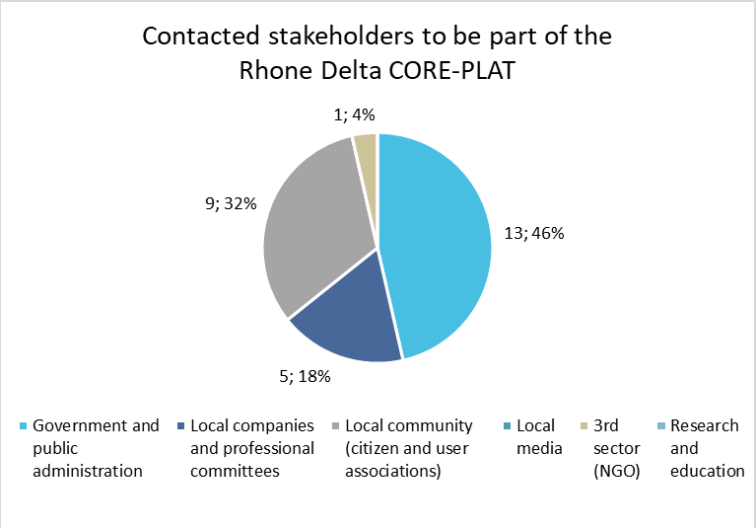

Figure 32. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Rhone Delta Pilot in November 2022 (Information retrieved and adapted from the M 1.3).

As the M1.3 shows, the Rhone Delta CORE-PLAT consisted of three committees:

1. The Technical Committee: to ensure day-to-day management, carrying out technical and monitoring studies of the site and preparing all the necessary documents for the validation of decisions by the Management committee.
2. The Board of Directors: to discuss and direct the strategic issues.
3. The Management Committee: to improve management, actions and developments to be carried out.

Developed activities[13]

As contemplated in the M1.3, the first REST-COAST meeting was held in January 2022. It was the official presentation of the REST-COAST in which the existing CORE-PLAT was recognized as a steering structure of the project. The following meetings were workshops that monitor the evolution of the actions carried out in the framework of all the projects in progress in the pilot site, including REST-COAST. The first annual workshop was held at the beginning of 2023, with the aim of assessing and validating the work done during the first year of the project.

[13] The information has been gathered for a preliminary understanding of the pilot' state of art, as a knowledge input for the unfolding of D1.2

7.2.6.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Considering the results of the pre-diagnosis with Pilots, the Rhone Delta Pilot was very comfortable in sending a request on barriers and enablers of coastal restoration to the SHs. Indeed, barriers and enablers for coastal restoration projects are regularly discussed during the meetings of the CORE-PLAT held bimonthly.

Key stakeholders' perspectives on barriers and enablers

In the Rhone Delta, the form mentioned above was answered by 5 actors. Respondents represent some of the invited groups, combining research and education institutions (40%, n=2), NGOs (40%, n=2) such as "Association de Protection de l'environment", as well as other organizations such as the "Collectivité Territoriale Syndicat mixte", which belong to local companies and professional committees (see Figure 33).

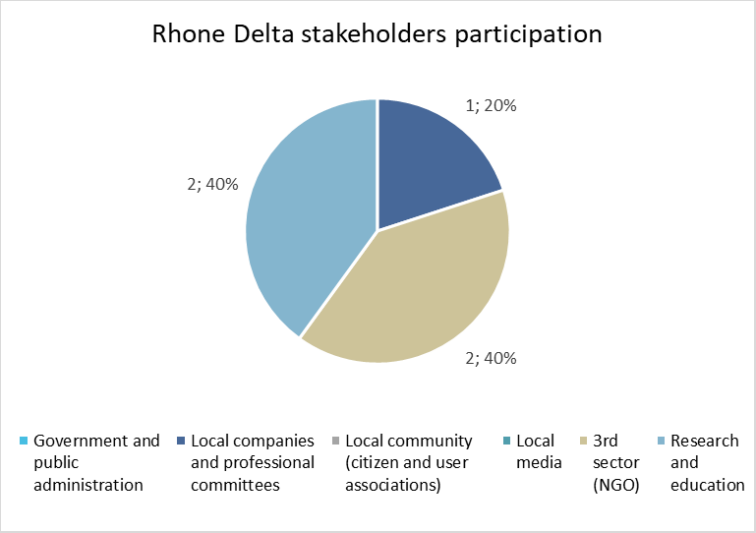

Figure 33. Key local stakeholders of the Rhone Delta Pilot that participated in the form.

On average, the Rhone Delta reported feeling comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 3.8 on five-point scale). This positive perception can be considered as an "enabler" since it could improve the discussion in the framework of the REST-COAST project. **Governance was seen by all SHs as the main barrier category for coastal restoration in the Rhone Delta, as well as the main potential enabler category**. They lightly agree with the perception of barriers as a relevant factor that has hampered coastal restoration efforts (average score is 3.4 on a five-point scale). However, there is no clear consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the past in the pilot area (average score is 3.2 on a five-point scale).

7.2.6.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analyzed in the Rhone Delta in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritized according to the relevance and the frequency determined by the Rhone Delta Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Rhone Delta pilot site, by integrating the SH's perceptions with the Pilot analysis. Both the barriers identified and not identified by the Pilot and the SHs, the percentage of SHs that identified each one of the barriers and the

degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 32). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 18 of the barriers, which means a high level of alignment between both perspectives (72%), while in 28% of the barriers (n=7), there was no coincidence between the Pilot and SHs.
- 32% (n=8) of the identified barriers by both groups are highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- In 40% (n=10) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

Table 32

Identified and unidentified barriers by the Pilot and SHs in the Rhone Delta pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence. The percentage of the SHs which coincided in the identification of each barrier is also represented in the table with a percentage.

		Identified/unidentified barriers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Rhone Delta Pilot level	Rhone SH1: Research and education	Rhone SH2: 3rd sector (NGO)	Rhone SH3: 3rd sector (NGO)	Rhone SH4: Local companies and professional committees	Rhone SH5: Research and education	Rhone SHs (%)	Rhone Delta Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)							-	0
	Lack of data and metrics for biodiversity							40%	1
	Lack of data and metrics for ecosystem services, ecological processes and functions							20%	1
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)							20%	1
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)							20%	1
	Delayed performance of restoration projects							-	0
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)							-	0
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)							-	0
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)							60%	2
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)							60%	2
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)							60%	2
	Limitations in coordinated decision making							40%	1
	Lack of social engagement in restoration activities							60%	2
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)							100%	2
	Focus on short term policies							60%	2
	Lack of convergence in stakeholders' interests							60%	2
	Lack of laws and policies engaging conservation, management and restoration of natural environments							40%	1
	Bureaucratic issues or delays in authorising the work or receiving work permits							-	0
	Dealing with socioeconomic needs							40%	1
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions							40%	1

	Low benefit-cost ratios (or a lack of cost-benefit evaluation)							-	0
	Low SHORT-TERM returns from investments							-	0
	Short term and small-scale bias							40%	1
	Business plans bound to local constraints							20%	1
	Lack of long-term economic support							80%	2

Highest coincidence

The highest coincidence is shown on the governance barrier of "negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)", with 100% of the SHs from all sectors in agreement with the Pilot.

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

One of the SHs identified the "waste of time convincing local users" as an important issue concerning restoration.

Financial

The Rhone Delta Pilot embraced "the research and education world pointed at the financial mechanisms of the restoration projects carried out so far in the Delta du Rhône". Indeed, they pointed at "the difficulties of financing long term actions causing impossibilities to hire people in the long term on substantive missions and who require to be able to project themselves further than the schedule of a project. It would be necessary to have guaranteed long-term funding not specifically dedicated to specific projects to be able to hire such people".

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the barriers in this Pilot. As prioritization criteria, the relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 28 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 11 (39%) of the diagnosed barriers are highly relevant (valued between 4 and 5) while 11 (39%) are less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 18% technical and another 46% governance, while 36% were financial barriers (Figure 33).

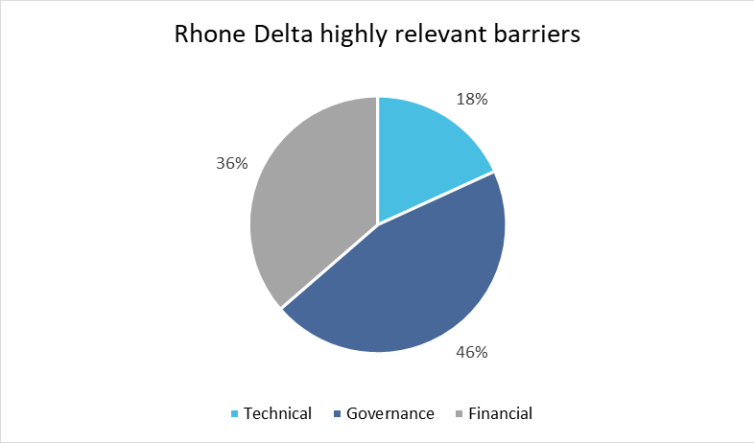

Figure 33. Highly relevant technical, governance and financial barriers in the Rhone Delta pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (11), 100% (n=11) were diagnosed as highly frequent, always appearing during the development of the restoration in the Rhone Delta Pilot. Those are the most relevant and frequent barriers:

- "Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)".
- "Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)".
- "Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)".
- "Dealing with socioeconomic needs".
- "Low benefit-cost ratios (or a lack of cost-benefit evaluation)".
- "Low short-term returns from investments short term and small-scale bias".
- "Lack of long-term economic support".
- "Lack of social engagement in restoration activities".
- "Focus on short term policies".
- "Lack of convergence in stakeholders' interests".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Rhone Delta Pilot (scored with a value of 5 in relevance and frequency), the most important technical barriers in the pilot site are both: the "**mismatch between protected species ecology and restoration works** (e.g., interventions overlapping with bird nesting season)" and the "**physical context specific of the site** (e.g., terrain typology, watershed, hydrological context, sand availability...)". However, the two main governance barriers were "**the negative social perception and pervasive inertia** (i.e., passive attitude of institutions and other stakeholders" as well as "**dealing with socioeconomic needs**". Finally, regarding the most relevant financial barriers, the Rhone Delta Pilot pointed at the following barriers as the most relevant: the "**low benefit-cost ratios** (or a lack of cost-benefit evaluation)", the "**low short-term returns from investments**", the "**short term and small-scale bias"**, and finally the "**lack of long-term economic support**".

Therefore, the technical, governance and financial barriers mentioned above are which should be established as priority to be addressed in the Rhone Delta Pilot and its CORE-PLAT. The following table (Table 33) contains the list of all the barriers identified by the Rhone Delta Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Rhone Delta Pilot were compared with the REST-COAST average of each of the barriers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the five previous barriers above (scored with a value of 5 in relevance and frequency), the "mismatch between protected species ecology and restoration works" was the furthest barrier from the REST-COAST average, for relevance (SD 1.7) and frequency (SD 2.2). On the contrary, this Pilot's score for the financial barrier "lack of long-term economic support" was the closest to the REST-COAST average, for relevance (SD 0.3) and frequency (SD 0.3). It is also worth to highlight higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends. Accordingly, **this comparison showed some barriers at the bottom of the table that also had higher relevance and frequency values than expected within the consortium** (see Table 33). This may require further discussion in the CORE-PLAT about their likeliness to act as barriers.

Table 33

Ranking of the total barriers for coastal restoration upscaling identified by the Rhone Delta Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Rhone Delta Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Rhone Delta pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Rhone Delta pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	5	2.6	1.7	5	1.9	2.2
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	5	3.8	0.9
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	5	3.4	1.1	5	3.4	1.1
Governance barriers	General barriers	Dealing with socioeconomic needs	5	4.2	0.5	5	4.2	0.5
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	5	4.2	0.5	5	3.9	0.8
Financial barriers	General barriers	Low SHORT-TERM returns from investments	5	3.9	0.8	5	3.4	1.1
Financial barriers	General barriers	Short term and small-scale bias	5	3.8	0.9	5	3.9	0.8
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Governance barriers	General barriers	Lack of social engagement in restoration activities	4	3.3	0.5	5	3.3	1.2
Governance barriers	General barriers	Focus in short term policies	4	3.3	0.5	5	3.4	1.1
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	4	3.9	0.1	5	4.2	0.5
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	3	4.0	0.7	5	4.0	0.7
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	3	4.0	0.7	5	3.9	0.8
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	3	4.3	0.9	4	3.7	0.2
Technical barriers	Further barriers	Acute degradation level and divergence in target state	3	3.4	0.3	3	3.6	0.4
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	3	3.6	0.4	3	3.4	0.3
Governance barriers	General barriers	Limitations in coordinated decision making	2	3.4	1.0	5	3.6	1.0
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	2	3.1	0.8	4	3.6	0.3

Financial barriers	General barriers	Business plans bound to local constraints	2	3.2	0.9	2	2.9	0.6
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	1	2.8	1.3	1	3.1	1.5
Technical barriers	General barriers	Lack of data and metrics for biodiversity	1	3.1	1.5	1	2.8	1.3
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	1	3.1	1.5	1	3.0	1.4
Technical barriers	General barriers	Delayed performance of restoration projects	1	2.6	1.1	1	2.6	1.1
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	1	2.9	1.3	1	2.2	0.9
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	1	3.0	1.4	1	3.1	1.5
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	1	3.0	1.4	1	3.1	1.5
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	1	2.8	1.3	1	2.9	1.3
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	1	3.7	1.9	1	3.4	1.7

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, and the distribution of the barriers was presented according to these parameters to detect which barriers which should be prioritized in the coastal restoration upscaling in the Rhone Delta pilot site (Figure 34). In the upper right quadrant, the technical barriers with the highest score were collected. The "**mismatch between protected species ecology and restoration works** (e.g., interventions overlapping with bird nesting season)" as well as "**the physical context specific of the site** (e.g., terrain typology, watershed, hydrological context, sand availability...)" had the greatest relevance for the Pilot and occurred more frequently, which should be addressed and reinforced in the Rhone Delta CORE-PLAT to facilitate coastal restoration.

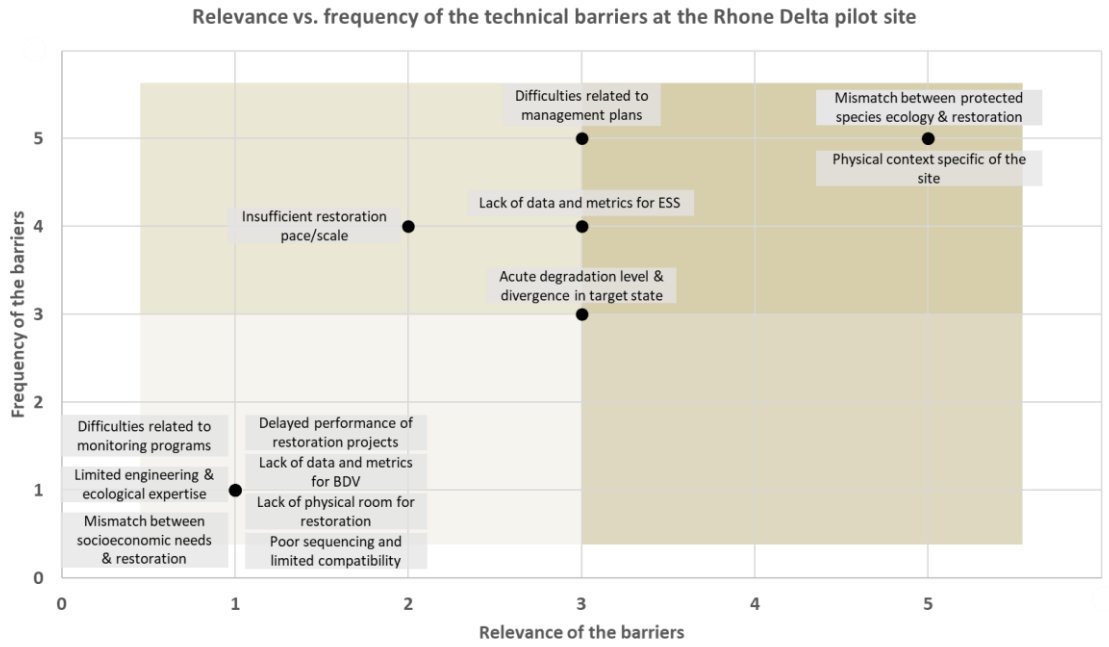

Figure 34. Relevance and frequency of the technical barriers at the Rhone Delta pilot site. The frequency of the barriers is a function of relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Rhone Delta pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections

with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 34). The "**difficulties related to management plans** (e.g., plans still to be defined, lack of consensus)" was considered the technical barrier with the highest score of connections to governance and financial barriers, followed by the "**lack of data and metrics for ecosystem services, ecological processes and functions**". Therefore, these technical barriers are being amplified by other type of barriers, which indicates that special attention or priority should be given to them, since they may imply a greater blockade to carry out restoration projects due to the numerous connections that they maintain with other types of barriers.

Table 34

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Rhone Delta pilot site.

		Rhone Delta Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for biodiversity	**Lack of data and metrics for ecosystem services, ecological processes and functions**	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	**Difficulties related to management plans (e.g., plans still to be defined, lack of consensus**	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability. ..)	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and trade-offs	Poor sequencing and limited compatibility with existing infrastructure
Governance barriers	**STRONG connections**	0	0	8	0	10	0	0	0	0	0	0	6	0
	WEAK connections	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial barriers	**STRONG connections**	0	0	4	0	10	2	0	0	0	6	0	4	0
	WEAK connections	0	0	0	0	0	0	0	0	0	0	0	0	0
	Score of STRONG connections between barriers	0	0	12	0	20	2	0	0	0	6	0	10	0
	Score of WEAK connections between barriers	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total score of connections between barriers	**0**	**0**	**12**	**0**	**20**	**2**	**0**	**0**	**0**	**6**	**0**	**10**	**0**

7.2.6.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Rhone Delta in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritized according to the relevance and the frequency determined by the Rhone Delta Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Rhone Delta pilot site, by integrating the SHs perceptions with the Pilot analysis (see Table 35):

- The Pilot and the SHs coincided in 10 of the enablers, which represents highest proportion (77%), while in 23% of the enablers (n=3), there was no coincidence between the Pilot and SHs.
- In addition, 31% (n=4) of the identified enablers are highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- However, in 46% (n=6) of the enablers, the Pilot coincided with less than 50% of the SHs.

Table 35

Identified and unidentified enablers by the Pilot and SHs in the Rhone Delta pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Rhone Delta Pilot level	Rhone SH1: Research and education	Rhone SH2: 3rd sector (NGO)	Rhone SH3: 3rd sector (NGO)	Rhone SH4: Local companies and professional committees	Rhone SH5: Research and education	Rhone SHs (%)	Rhone Delta Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)							60%	2
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)							20%	1
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)							20%	1
	Proactive maintenance with performance indicators							20%	1
	Willingness to promote restoration among stakeholders							60%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)							-	0
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)							-	0
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)							40%	1
	New plans for transition in governance (promoting participation and sharing the benefits)							80%	2
	Continued training for deeper stakeholder involvement							40%	1
FINANCIAL ENABLERS	Increasing restoration funding							80%	2
	Innovative value-capture instruments and business models							-	0
	Improved capacity to develop business models and bankable plans							20%	1

Highest coincidence

- The highest coincidence was shown on the following governance enablers: “new plans for transition in governance (promoting participation and sharing the benefits)” identified by 80% of the SHs. It was followed by the financial enabler “increasing restoration funding” perceived by 80% of the SHs.
- Other enablers with highest coincidence were the “advanced forecasting models that support connectivity restoration”, and “willingness to promote restoration among stakeholders” which was shown by 60% of SHs.

Proposed enablers

In this case, the Rhone Delta Pilot did not identify any other governance, technical or financial enablers other than those proposed.

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Rhone Delta Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered “highly relevant enablers” while enablers between 1 and 3 were considered “less relevant enablers”.

- A total of 13 enablers were diagnosed and valued, including technical but also financial and governance ones.
- A total of 5 enablers (38%) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 8 enablers (62%) were less relevant (between 2 and 3).
- From the highly relevant enablers, the governance ones were 60% and technical account for 40% (Figure 35).

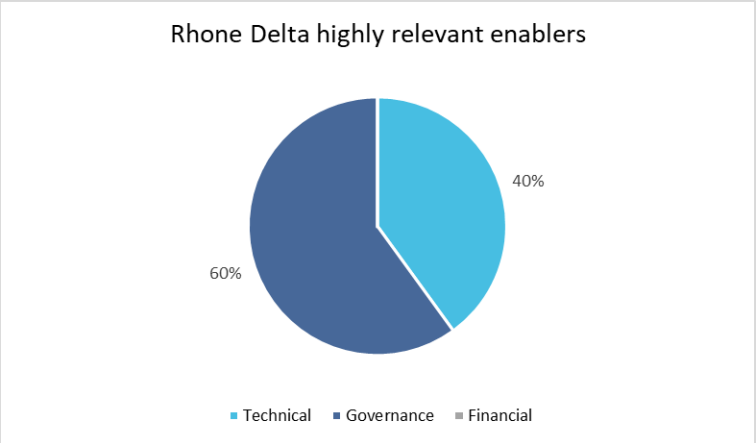

Figure 35. Highly relevant technical, governance and financial enablers in the Rhone Delta pilot site.

Frequency of the enablers

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered “highly frequent” while the enablers scored between 1 and 3 were considered “less frequent”.

From those highly relevant enablers (total of 5 highly relevant enablers), 80% (n=4) were diagnosed as highly frequent, facilitating the development of restoration in the Rhone Delta Pilot. Those are the most relevant and frequent:

- “Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)”
- “Willingness to promote restoration among stakeholders”.
- “Explicit accounting of coastal natural capital (biodiversity and ecosystem services)”
- “New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)”

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Rhone Delta Pilot (scored with a value of 5 in relevance and frequency) the highest priority belongs to the technical enablers were the "**advanced forecasting models that support connectivity restoration** (e.g., sediment transport modelling)" and "**willingness to promote restoration among stakeholders**", which have gathered the main priority. While at the governance level were the "**explicit accounting of coastal natural capital** (biodiversity and ecosystem services)" and "**new policies towards decarbonised coastal protection** (e.g., NBS vs. Grey infrastructure)" (see Table 36).

The following table (Table 36) contains the list of all the enablers identified by the Rhone Delta Pilot, ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Rhone Delta Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the enablers above (scored with a value of 5 in relevance and frequency), the "explicit accounting of coastal natural capital" and the "new policies towards decarbonised coastal protection" are further from the REST-COAST average for relevance (SD 1.3 and 1.1, respectively) and frequency (SD 1.9 and 1.6, respectively) than the other enablers. On the contrary, this Pilot's score for the "willingness to promote restoration among stakeholders" is the closest to the REST-COAST average (with a SD value of 0.8 for relevance and 0.9 for frequency). It is worth to highlight the technical enabler "**increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)"** that was perceived as very frequent (SD 2) but lightly relevant in the Rhone Delta, contrasting with the situation in other Pilots. Also, the "**implementation and planning with a safe operating physical space**" was contrasting with the REST-COAST average in terms of lower relevance (SD 1.3) although highly frequent (SD 1.7). These last enablers could be promoted as potential enablers in other Pilots.

Table 36

Ranking of the total enablers for coastal restoration upscaling identified by the Rhone Delta Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Rhone Delta Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this ENABLER at the Rhone Delta pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Rhone Delta pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	5	4.0	0.7	5	3.4	1.1
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	5	3.9	0.8	5	3.8	0.9
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	5	3.2	1.3	5	2.3	1.9
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	5	3.4	1.1	5	2.7	1.6
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	5	3.2	1.3	2	2.3	0.2
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	2	2.8	0.5	5	2.2	2.0
Financial enablers	General enablers	Increasing restoration funding	2	3.4	1.0	2	2.6	0.4
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	2	3.3	0.9	1	3.1	1.5
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	1	2.9	1.3	5	2.6	1.7
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	1	2.7	1.2	3	2.8	0.2
Technical enablers	General enablers	Proactive maintenance with performance indicators	1	3.2	1.6	1	2.4	1.0
Financial enablers	General enablers	Innovative value-capture instruments and business models	1	3.2	1.6	1	2.9	1.3
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	1	2.6	1.1	1	2.7	1.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of enablers according to these parameters where detecting which enablers which should be prioritized to become an opportunity for coastal restoration upscaling in the Rhone Delta pilot site (Figure 36). In the upper right quadrant, the technical enablers with the highest score were collected. "**Advanced forecasting models**" and "**willingness to promote restoration among stakeholders**" had the greatest relevance and frequency in the Pilot, which should be addressed and reinforced in the Rhone Delta CORE-PLAT to generate opportunities and facilitate coastal restoration.

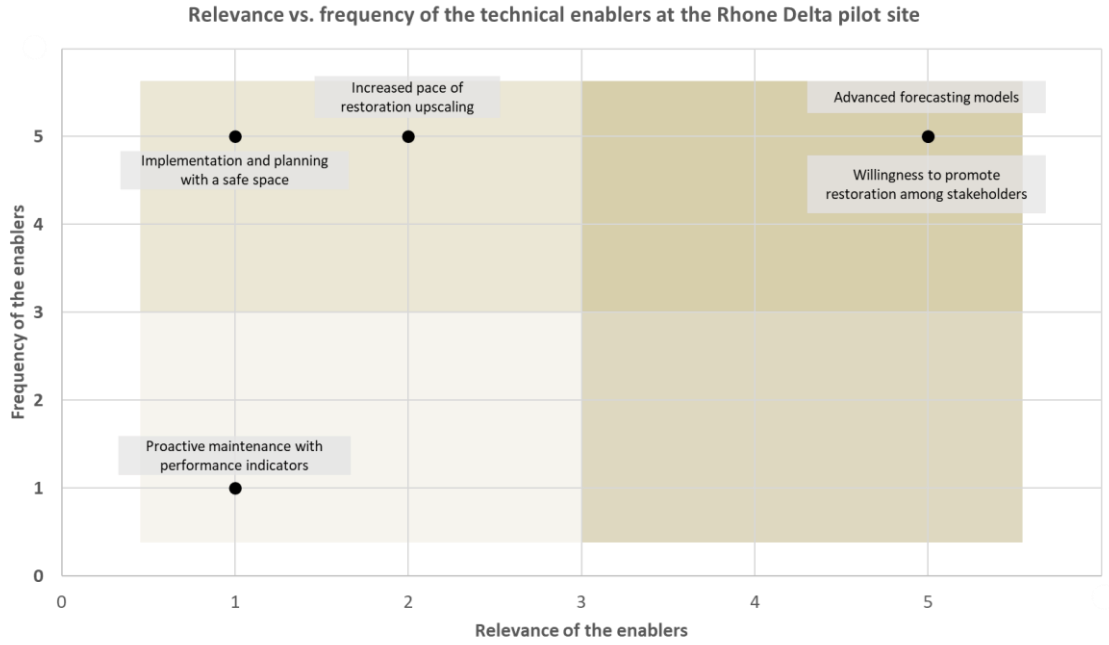

Figure 36. Relevance and frequency of the technical barriers at the Rhone Delta Pilot site. The frequency of the enablers is a function of relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.
In this section, there are the results of the connections between the technical with governance and financial enablers related to the Rhone Delta pilot site. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial enablers were determined as "weak connections", scored with 1 (occasional connection) and "strong connections" scored with 2 (frequent connection). In case of no connection between enablers, the score was 0. Secondly, a summary of the total strong and weak connections between technical and financial and governance was compiled in the Table 37. The "**advanced forecasting models that support connectivity restoration**" and the "**increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions**" were considered the technical enablers with the highest connection scores to governance and financial enablers. Thus, both previous technical enablers are being amplified which the governance and the financial ones, which emerge a great opportunity to promote and facilitate the coastal restoration upscaling.

Table 37
A summary of the total connections (strong and weak) between each of the technical enablers of the Rhone Delta pilot site and governance and financial enablers.

		Rhone Delta Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	**Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)**	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	**Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)**	Proactive maintenance with performance indicators	Willingness to promote restoration among stakeholders
Governance enablers	**STRONG connections**	4	2	2	0	2
	WEAK connections	0	2	1	0	0
Financial enablers	**STRONG connections**	2	0	2	0	2
	WEAK connections	0	0	0	0	0
	Score of STRONG connections between enablers	6	2	4	0	4
	Score of WEAK connections between enablers	0	2	1	0	0
	Total score of connections between enablers	**6**	**4**	**5**	**0**	**4**

7.2.6.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category for coastal restoration in the Rhone Delta, as well as the main potential enabler category**. The area concentrates many economic, ecological, and sociological interests, with a multitude of actors with conflicting interests. In the past, the local population was not sufficiently included in the governance processes, which created local tensions.
- In the Rhone Delta pilot site, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. The highest coincidence between the perspectives of both groups was found in the **governance barriers**. As for enablers, the highest coincidences between these two groups were on two enablers: “new plans for transition in governance” (governance) and “increasing restoration funding” (financial).
- **Most of the highly relevant barriers were governance (46%)**, in contrast to technical (18%) and financial (36%) barriers. In addition, **among the highly relevant barriers, 100% were diagnosed as highly frequent**, always appearing during the development of the restoration in the Rhone Delta Pilot.
- **Considering the most relevant and frequent barriers in the Rhone Delta Pilot, half of these (50%) were financial barriers**. These barriers were the “low benefit-cost ratios (or a lack of cost-benefit evaluation)”, the “low short-term returns from investments”, the “short term and small-scale bias”, and finally the “lack of long-term economic support”. This last financial barrier was also relevant for SHs, due to it was detected by 80% of the SHs.
- **The most relevant and frequent technical barrier were the “mismatch between protected species ecology and restoration works** (e.g., interventions overlapping with bird nesting season)” and “**the physical context specific of the site** (e.g., terrain typology, watershed, hydrological context, sand availability...)”. This last technical barrier was also detected by 60% of the SHs. However, the number of connections of these technical barriers with other types of barriers was low, with other less relevant

and frequent barriers being those that are amplified by governance and financial barriers, such as the "difficulties related to management plans" and the "lack of data and metrics for ecosystem services, ecological processes and functions".

- **Most of the highly relevant enablers were governance (60%) and, among the highly relevant enablers, 80% were diagnosed as highly frequent**, facilitating the development of restoration in the Rhone Delta Pilot. On the one hand, at a technical level, the "**advanced forecasting models that support connectivity restoration**" and "**willingness to promote restoration among stakeholders**" were the most relevant and frequent technical enablers in this Pilot, these results being consistent with the SHs' perspective, since these two enablers were detected by 60% of the SHs. In addition, the enabler "**advanced forecasting models that support connectivity restoration**" was the one that had the highest score of connections to governance and financial enablers along with the "increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions" but the latter being less relevant. On the other hand, at the governance level, the "**explicit accounting of coastal natural capital** (biodiversity and ecosystem services)" and "**new policies towards decarbonised coastal protection** (e.g., NBS vs. Grey infrastructure)" were the most relevant and frequent enablers in this pilot site to be reinforced for coastal restoration.

7.2.7 Sicily Pilot - barriers and enablers local report

7.2.7.1 Pilot context

Pilot regional context[14]

This Pilot site is in southern Italy and consists of 2,250 ha of coastal strip of salt marshes, with 250 ha already restored. The main goal is to restore an additional 320 ha. The planned restoration actions include: reshaping aquaculture basins in the Longarini lagoon in order to build channels, restoring ecological connectivity; building small islands in the Longarini, Gorgo Salato and Bruno lagoons to foster habitat creation and birds nesting and breeding; construction of a weir on the channel connecting the Longarini lagoons with the sea in order to better manage water volumes within the lagoon and to avoid too fast drying of the lagoon; and the renaturalization of several areas characterized by intensive agriculture with the construction of new habitats (reeds).

Pilot current situation regarding barriers and enablers for coastal restoration

On the one hand, Pilot leaders stated that the main barrier is related to the current governance system. They highlighted the need for a more integrated approach, rather than abiding by the current limitations of coastal protected areas. Furthermore, conflicts between local socio-economic interests and environmental restoration proposals are frequent, particularly due to: “cumbersome governance procedures, lack of clear policies, uncoordinated multiple authorities at both regional and local levels, bureaucratic hurdles, uncertain funding which tend to discourage the planning and implementation of long-term restoration actions, etc.”. Regarding the technical barriers, the Pilot expressed their concern particularly in terms of the lack of complete understanding of the physical process that controls the hydraulic connectivity, how to act in the case of critical situations (e.g., lagoon level control, dune management, sediment transport, etc.), and how to face the difficult interaction with infrastructures. They also highlighted the fact that there is scarce integrated monitoring of climate variables.

On the other hand, regarding the enablers, they established that in all the restoration actions in the pilot site, the key enabler was the presence of advocacy groups, usually NGOs, that pushed either the regional government or other bodies. For example, the Vendicari Natural Reserve was established after a group of local citizens opposed the installation of oil and gas industries in the area.

The CORE-PLAT Status

CORE-PLAT members

According to Milestone 1.3, there were 10 relevant SHs identified, of which 4 were engaged from an early stage. Three of them are considered very powerful: two regional authorities involved in managing the site, Nature Reserve *Oasi Faunistica di Vendicari* and the local water agency, which is also a partner of the University of Catania in other projects; and *Stiftung Pro Artenvielfalt*, a German wildlife protection NGO that manages and funds restoration through donations in the Cuba-Longarini site, and also shares data and co-designs the field survey monitoring network (see Figure 37). In contrast, in the initial stages of the constitution of the CORE-PLAT, some powerful entities were not contacted, such as the Government Commissioner, who is against the hydro-geologic hazard and an important farmers’ association, IGP Pachino, which in the past have opposed the creation of a nature reserve in the area. The participation of the municipalities of Pachino and Ispica are considered desirable, and they will probably be invited to join the CORE-PLAT in the future.

[14] The following information has been gathered from the Pilot’s contribution to the current deliverable, as well as from the background context provided on the “REST-COAST common questionnaire for Pilots initial data gathering”, led by REST-COAST coordinators.

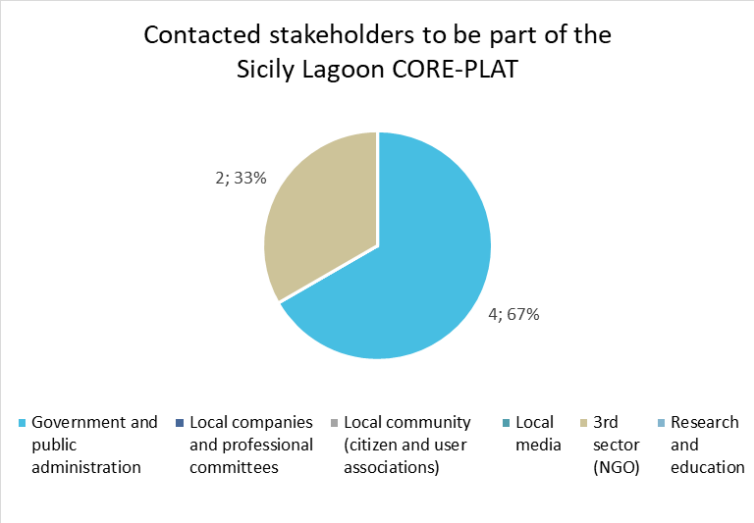

Figure 37. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Sicily Lagoon Pilot on November 2022 (Information retrieved and adapted from the M 1.3).

Developed activities[15]

The Pilot stated that when they discussed with SHs, both during individual meetings and in plenary sessions, they found that networking between different SHs is felt as a general need for a stronger and more coordinated action. Both groups discussed the barriers and enablers for coastal restoration in small groups, and they had a large SH meeting on March 17th, 2023. Furthermore, it was stated that the inertia of some policy and decision makers was felt as a problem to the proper establishment of a local COREPLAT. Some relevant SHs offered to promote a larger and stronger involvement of other SHs (mainly local municipalities).

7.2.7.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Regarding the pre-diagnosis form, the Pilot stated that "they had discussed the issue of barriers and enablers in small groups, and that they had a large stakeholder meeting on the March 17th". They also expressed the fact that they were comfortable with the task of participating in a form to analyse the barriers and enablers for coastal restoration in their pilot case with their own information (expert criteria), but also considering stakeholders' perspectives.

Key stakeholders' perspectives on barriers and enablers

The NGOs of this Pilot site have a relevant role in promoting restoration actions, and their participation in the survey on barriers and enablers for restoration was relevant (see Figure 38). In some cases, they are involved in the management of a site (e.g., LIPU). Nevertheless, the lack of expertise in engineering and ecology and the lack of data were identified as the main technical barriers. While the SHs complain about the lack of proper funding, from the Pilot's point of view, the discontinuity and uncertainty of funding may be the real problem. Regarding governance, the variety of responses demonstrated the general weakness of the governance system.

[15] The information has been gathered for a preliminary understanding of the Pilot' state of art, as a knowledge input for the unfolding of D1.2

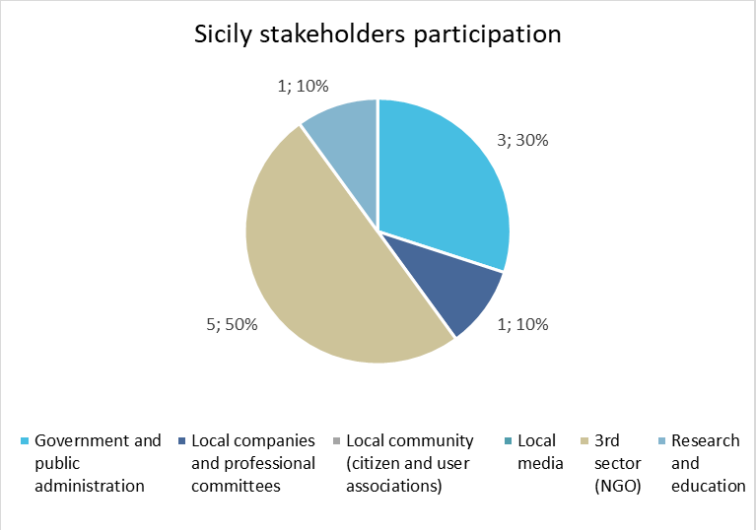

Figure 38. Key local stakeholders of the Sicily Pilot that participated in the form.

Sicily Pilot reported feeling somewhat comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 3.7 on five-point scale). This perception could improve the discussion in the frame of the REST-COAST project. **Governance was considered by all SHs to be the main barrier category for coastal restoration in the Sicily Pilot, while also being the main enabler category.** They consistently agreed with the perception of barriers as a relevant factor hampering coastal restoration efforts (average score is 4.4 on a five-point scale). However, there was no consensus regarding the consideration of enablers as a relevant factor boosting coastal restoration efforts in the pilot area (average score is 2.3 on a five-point scale).

7.2.7.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Sicily Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritized according to the relevance and the frequency determined by the Sicily Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences on perspectives from Pilots and SH views: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Sicily Pilot site, by integrating the SHs' perceptions with the Pilot analysis. Both barriers identified and not identified by the Pilot and SHs, the percentage of SHs that identified each one of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 38). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 22 of the barriers, which means a high level of alignment between both perspectives (88%), while in 14% of the barriers (n=3), there was no coincidence between the Pilot and SHs.
- 41% (n=9) of the identified barriers by both groups are highly coincident. These are the barriers identified by the Pilot and at least 50% of the SHs.
- In 59% (n=13) of the coincident barriers, the Pilot coincided with less than 50% of the SHs.

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Table 38

Identified and unidentified barriers by the Pilot and SHs in the Sicily pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence barriers. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers												
		Pilot perspective	Stakeholders' perspective											Pilot + SHs perspective
		Sicily Pilot level	Sicily SH1: 3rd sector (NGO)	Sicily SH2: 3rd sector (NGO)	Sicily SH3: Government and public admin.	Sicily SH4: 3rd sector (NGO)	Sicily SH5: Government and public admin.	Sicily SH6: Local companies and professional committees	Sicily SH7: 3rd sector (NGO)	Sicily SH8: Research and education	Sicily SH9: Government and public admin.	Sicily SH10: 3rd sector (NGO)	Sicily SHs (%)	Sicily Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)												80%	2
	Lack of data and metrics for biodiversity												30%	1
	Lack of data and metrics for ecosystem services, ecological processes and functions												60%	2
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)												-	0
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)												70%	2
	Delayed performance of restoration projects												20%	1
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)												10%	1
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)												30%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)												20%	1
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)												20%	1
GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)												50%	2
	Limitations in coordinated decision making												40%	1
	Lack of social engagement in restoration activities												50%	2
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)												50%	2
	Focus in short term policies												30%	1
	Lack of convergence in stakeholders' interests												30%	1
	Lack of laws and policies engaging conservation, management, and restoration of natural environments												70%	2
	Bureaucratic issues or delays in authorising the work or receiving work permits												50%	2
	Dealing with socioeconomic needs												10%	1
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions												50%	2
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)												-	0
	Low SHORT-TERM returns from investments												-	0

	Short term and small-scale bias												30%	1
	Business plans bound to local constraints												20%	1
	Lack of long-term economic support												40%	1

Highest coincidence

The highest coincidence is shown on:

- "Limited engineering and ecological expertise (80% of SHs coincided with the Pilot's perspective)".
- "Difficulties related to management plans (70% of SHs coincided with the Pilot's perspective)".
- "Lack of laws and policies engaging conservation, management and restoration of natural environments (70% of SHs coincided with the Pilot's perspective)".

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

The Sicily group of the SHs detected the following barriers:

- "Insensitivity to issues."
- "Lack of experimental experience in restoring biotic conditions."

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the barriers in this Pilot. As a prioritization criterion, relevance has gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 28 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 17 (61%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 11 (39%) were valued as less relevant barriers (between 1 and 3).
- As for the highly relevant barriers, those of governance represented 41%, while the technical ones 35%, and the financial ones 24% (see Figure 39).

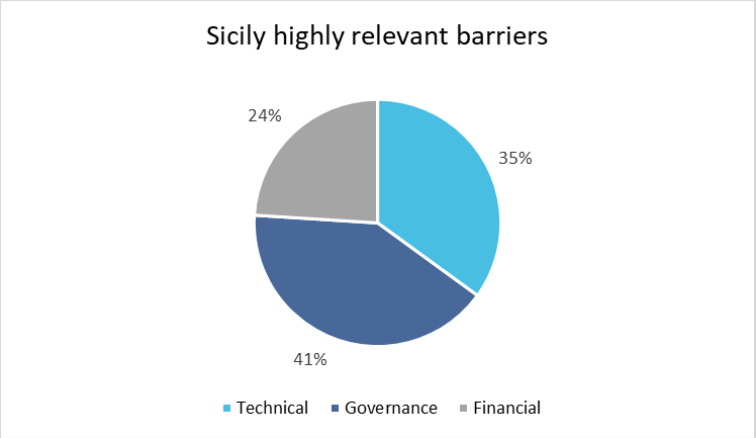

Figure 39. Highly relevant technical, governance and financial barriers in the Sicily pilot site.

Frequency of the barriers

The value of the frequency of the barriers is between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 17 highly relevant barriers), 100% were diagnosed as highly frequent, always appearing while developing restoration in the Sicily Pilot. Those are the most relevant:

- "Lack of data and metrics for ecosystem services, ecological processes and functions".
- "Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)".
- "Limitations in coordinated decision making".
- "Lack of laws and policies engaging conservation, management and restoration of natural environments".
- "Bureaucratic issues or delays in authorizing the work or receiving work permits".
- "Business plans bound to local constraints".
- "Lack of long-term economic support".
- "Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)".
- "Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)".
- "Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)".
- "Poor sequencing and limited compatibility with existing infrastructure".
- "Low benefit-cost ratios (or a lack of cost-benefit evaluation)".
- "Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)".
- "Focus on short term policies".
- "Lack of convergence in stakeholders' interests".
- "Dealing with socioeconomic needs".
- "Short term and small-scale bias".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Sicily Lagoon Pilot (scored with a value of 5 in relevance and frequency), the most important technical barrier in the pilot site is the "**lack of data and metrics for ecosystem services, ecological processes and functions**". In addition, the four main governance barriers

for the Pilot were the "**lack of integrated approach**", the "**limitations in coordinated decision making**", the "**lack of laws and policies engaging conservation, management and restoration of natural environments**" and the "**bureaucratic issues or delays in authorising the work or receiving work permits**". Finally, regarding the most relevant and frequent financial barriers, the Sicily Lagoon Pilot pointed at the "**business plans bound to local constraints**" and the "**lack of long-term economic support**" (see Table 39).

Therefore, the technical, governance and financial barriers mentioned above are the barriers which should be established as priority to be addressed in the Rhone Delta Pilot and its CORE-PLAT. Thus, the following table (Table 39), contains the list of all the barriers identified by the Sicily Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Sicily Pilot were compared with the REST-COAST average of each of the barriers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the seven previous barriers (scored with a value of 5 in relevance and frequency), the "lack of laws and policies engaging conservation, management and restoration of natural environments" and "business plans bound to local constraints" were the barriers that are furthest from the REST-COAST average of relevance (SD 1.6 and 1.3, respectively) and frequency (SD 1.5 and 1.5, respectively). On the contrary, this Pilot's score for the financial barrier "lack of long-term economic support" was the closest to the REST-COAST average, for relevance (SD 0.3) and frequency (SD 0.3). It is also worth to highlight high deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends, as the technical barrier "**difficulties related to management plans**", that was perceived to be much less relevant for the Sicily Pilot than for the REST-COAST consortium (SD 1.4). In addition, the technical barrier "**physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**" was a very relevant barrier and occurs with a relatively frequency at the overall REST-COAST project, but it was perceived to be much less relevant (SD 1.8) and frequent (SD 1.9) for the Sicily Pilot. Finally, other technical relevant barriers in this Pilot (scored with a value of 4) compiled in the table had a lower frequency in the overall project but they occur frequently in the Sicily Pilot (see Table 39).

Table 39

Ranking of the total barriers for coastal restoration upscaling identified by the Sicily Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Sicily Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Sicily pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Sicily pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	5	4.3	0.5	5	3.7	0.9
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	5	3.9	0.8
Governance barriers	General barriers	Limitations in coordinated decision making	5	3.4	1.1	5	3.6	1.0
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	5	2.8	1.6	5	2.9	1.5
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	5	3.7	0.9	5	3.4	1.1
Financial barriers	General barriers	Business plans bound to local constraints	5	3.2	1.3	5	2.9	1.5
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity	4	2.8	0.9	5	3.1	1.3

		into account; preference for grey infrastructure than for NBS)						
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	4	3.1	0.6	5	3.0	1.4
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	4	3.0	0.7	5	3.1	1.3
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	4	3.0	0.7	5	3.1	1.3
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	4	4.2	0.2	5	3.9	0.8
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	4	2.9	0.8	4	2.2	1.3
Governance barriers	General barriers	Focus in short term policies	4	3.3	0.5	4	3.4	0.4
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	4	3.9	0.1	4	4.2	0.2
Governance barriers	General barriers	Dealing with socioeconomic needs	4	4.2	0.2	4	4.2	0.2
Financial barriers	General barriers	Short term and small-scale bias	4	3.8	0.2	4	3.9	0.1
Technical barriers	Further barriers	Acute degradation level and divergence in target state	3	3.4	0.3	3	3.6	0.4
Governance barriers	General barriers	Lack of social engagement in restoration activities	3	3.3	0.2	3	3.3	0.2
Financial barriers	General barriers	Low SHORT-TERM returns from investments	3	3.9	0.6	3	3.4	0.3
Technical barriers	General barriers	Delayed performance of restoration projects	3	2.6	0.3	2	2.6	0.4
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	3	3.4	0.3	2	3.4	1.0
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	2	3.6	1.1	4	3.4	0.4
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	2	4.0	1.4	3	4.0	0.7
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	2	3.1	0.8	3	3.6	0.4
Technical barriers	General barriers	Lack of data and metrics for biodiversity	2	3.1	0.8	2	2.8	0.5
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	2	4.5	1.8	1	3.8	1.9
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	1	2.6	1.1	1	1.9	0.6

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, and the distribution of the barriers is represented according to these parameters to detect which barriers should be prioritized to become in the coastal restoration upscaling in the Sicily pilot site (Figure XX). In the upper right quadrant, the technical barriers with the highest score are collected. The "**lack of data and metrics for ecosystem services, ecological processes and functions**" had the highest relevance and occurred more frequently according to the Pilot, which should be addressed and reinforced in the Sicily CORE-PLAT to generate opportunities and facilitate coastal restoration. Other barriers had a frequent occurrence, although they were considered less relevant and frequent than the previous one (see Figure 40).

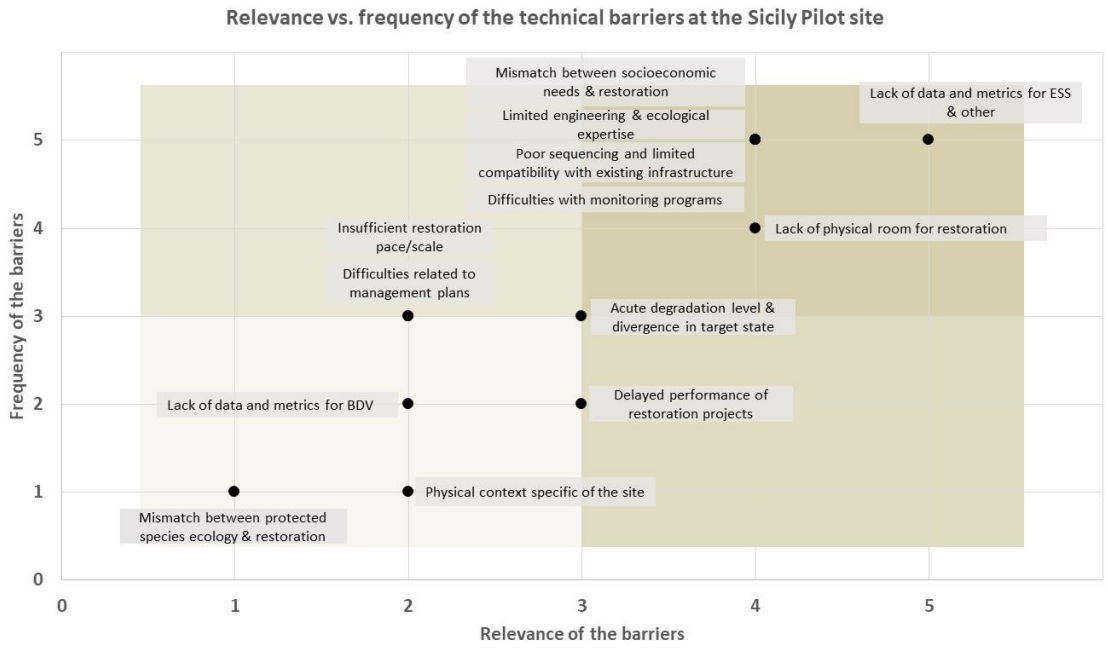

Figure 40. Relevance and frequency of the technical barriers at the Sicily pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Sicily pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 40). The "**mismatch between socioeconomic needs and restoration works** (e.g., interventions overlapping with bathing season)" was considered the technical barrier that the highest score of connections to governance and financial barriers, being amplified by these other barriers, followed by the "**lack of data and metrics for ecosystem services, ecological processes and functions**" and the "**poor sequencing and limited compatibility with existing infrastructure**". A greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus, these barriers should be addressed as a priority, as these may become a stronger impediment to coastal restoration.

Table 40

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Sicily pilot site.

		Sicily Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	**Lack of data and metrics for ecosystem services, ecological processes and functions**	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	Delayed performance of restoration projects	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	**Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)**	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and trade-offs	**Poor sequencing and limited compatibility with existing infrastructure**
Governance barriers	**STRONG connections**	8	2	8	6	6	4	6	2	12	2	2	4	8
	WEAK connections	1	1	1	1	0	0	1	1	0	0	0	1	1
Financial barriers	**STRONG connections**	2	4	4	2	2	2	2	0	6	0	0	0	4
	WEAK connections	1	1	1	2	0	0	0	0	0	0	0	0	1
	Score of STRONG connections between barriers	10	6	12	8	8	6	8	2	18	2	2	4	12
	Score of WEAK connections between barriers	2	2	2	3	0	0	1	1	0	0	0	1	2
	Total score of connections between barriers	**12**	**8**	**14**	**11**	**8**	**6**	**9**	**3**	**18**	**2**	**2**	**5**	**14**

7.2.7.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Sicily Pilot in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between stakeholder and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both**. Secondly, there is the representation of the results from the quantitative analysis in which the enablers were prioritized according to the relevance and the frequency determined by the Sicily Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences on Perspectives from Pilots and SH views for both Pilots and SH: a qualitative analysis

This section provides information on the degree of coincidence of the enablers identified in the Sicily pilot site, by integrating the SHs perceptions with the Pilot analysis (see Table 41):

- The Pilot and the SHs coincided in 12 of the enablers, which represents a very high proportion (92%). Having an aligned vision on the enablers between both groups could be a key factor to boost the practice of restoration in the area.
- The enablers in which the most concurrence was shown gathered 70% of the attention of the SHs.
- 33% (n=4) of the identified enablers by both groups are highly coincident. It means the conjunction of the Pilot with at least 50% of the SHs.
- In 67% (n=8) of the coincident enablers, the Pilot coincided with less than 50% of the SHs.

Table 41

Identified and unidentified enablers by the Pilot and SHs in the Sicily pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers												
		Pilot perspective	Stakeholders' perspective											Pilot + SHs perspective
		Sicily Pilot level	Sicily SH1: 3rd sector (NGO)	Sicily SH2: 3rd sector (NGO)	Sicily SH3: Government and public admin.	Sicily SH4: 3rd sector (NGO)	Sicily SH5: Government and public admin.	Sicily SH6: Local companies and professional committees	Sicily SH7: 3rd sector (NGO)	Sicily SH8: Research and educatio n	Sicily SH9: Government and public admin.	Sicily SH10: 3rd sector (NGO)	Sicily SHs (%)	Sicily Pilot + SHs
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)												20%	1
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)												20%	1
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)												10%	1
	Proactive maintenance with performance indicators												40%	1
	Willingness to promote restoration among stakeholders												60%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)												50%	2
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)												40%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)												20%	1
	New plans for transition in governance (promoting participation and sharing the benefits)												20%	1
	Continued training for deeper stakeholder involvement												50%	2
FINANCIAL ENABLERS	Increasing restoration funding												70%	2
	Innovative value-capture instruments and business models												30%	1
	Improved capacity to develop business models and bankable plans												-	0

Highest coincidence

The highest coincidence was on the financial enabler of "increasing restoration funding", which was identified by the Pilot and 70% of the SHs.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. It is:

Governance

- Sicily Pilot proposed the following enabler: "advocacy group actions (usually ONGs)".

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritisation of the enablers in the Sicily Pilot. As a prioritisation criterion, relevance gained importance over frequency, considering this las variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 14 enablers were diagnosed and scored, including technical but also financial and governance ones.
- A total of 10 (71%) of the diagnosed enablers were highly relevant (valued between 4 and 5) while 4 (29%) were valued as less relevant enablers (between 1 and 3).
- As for the highly relevant enablers, 40% were technical enablers as well as governance ones (40%), and those of financial represented 20% (Figure 41).

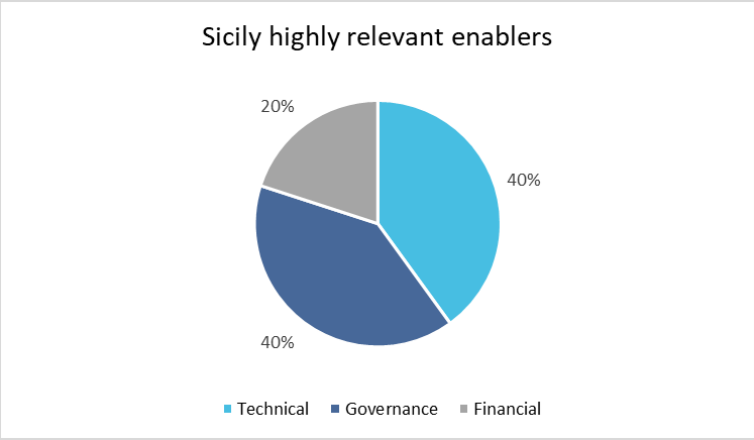

Figure 41. Highly relevant technical, governance and financial enablers in the Sicily pilot site.

Frequency of the enablers

The value of the frequency of the enablers is between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 10 highly relevant enablers), 70% (n=7) were diagnosed as highly frequent, facilitating the development of restoration in the Sicily Pilot. Those are the most relevant and frequent:

- "Proactive maintenance with performance indicators".
- "Willingness to promote restoration among SHs".
- "Advocacy group actions (usually ONGs). This is an enabler proposed by the Pilot".
- "Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)".
- "Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)".
- "New plans for transition in governance (promoting participation and sharing the benefits)".
- "Continued training for deeper stakeholder involvement".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Sicily Pilot (scored with a value of 5 in relevance and frequency), the highest priority belongs to the following technical enablers: the "**proactive maintenance with performance indicators"** and the **"willingness to promote restoration among stakeholders**". At the

governance level, the most relevant and frequent enabler was the one proposed by the Pilot, the "**advocacy group actions (usually NGO's)**" (see Table 42).

The following table (Table 42) contains the list of all the enablers identified by the Sicily Pilot (including their own proposals), ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Sicily Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. On the one hand, considering the three previous barriers (scored with a value of 5 in relevance and frequency), the "proactive maintenance with performance indicators" was the barrier that is furthest from the REST-COAST average for relevance (SD 1.3) and frequency (SD 1.8). On the contrary, thus Pilot's score for the technical barrier "willingness to promote restoration among stakeholders" was closer to the REST-COAST average. The score of the governance enabler "advocacy group actions (usually ONGs)" could not be compared with the REST-COAST average because it was a Pilot's proposal.

On the other hand, it is worth to highlight the technical enabler "**implementation and planning with a safe operating physical space**" that was perceived as very relevant (SD 1.5) and frequent (SD 1), contrasting with the situation in other REST-COAST Pilots. In addition, the governance enabler "**there are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)**" was perceived as relatively relevant and frequent in other Pilots, but non-relevant (SD 1.6) and rarely occurs in the Sicily pilot site (SD 1.5). Thus, considering the potential of this last enabler as a facilitator in other Pilots, to promote it for the future of co-creation in the Sicily Pilot would be a valuable opportunity for coastal restoration upscaling.

Table 42

Ranking of the total enablers for coastal restoration upscaling identified by the Sicily Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Sicily Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Sicily pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Sicily pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	General enablers	Proactive maintenance with performance indicators	5	3.2	1.3	5	2.4	1.8
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	5	3.9	0.8	5	3.8	0.9
Governance enablers	Proposed enablers	Advocacy group actions (usually ONGs)	5	-	-	5	-	-
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	5	2.9	1.5	4	2.6	1.0
Financial enablers	General enablers	Innovative value-capture instruments and business models	5	3.2	1.3	3	2.9	0.1
Financial enablers	General enablers	Increasing restoration funding	5	3.4	1.1	1	2.6	1.1
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	4	4.0	0.0	5	3.4	1.1
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	4	2.7	0.9	4	2.8	0.9
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	4	3.2	0.5	4	2.3	1.2
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	4	3.4	0.4	2	2.7	0.5
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	3	3.2	0.2	1	2.3	0.9
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	2	2.8	0.5	2	2.2	0.2
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	1	3.3	1.6	1	3.1	1.5
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	1	2.6	1.1	1	2.7	1.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, and the distribution of the enablers was represented according to these parameters to detect which enablers which should be prioritized to become an opportunity for coastal restoration upscaling in the Sicily pilot site (Figure 42). In the upper right quadrant, the technical enablers with the highest score were collected. The following technical enablers "**proactive maintenance with performance indicators**" and the "**willingness to promote restoration among stakeholders**" were identified as most relevant and frequent, which should be addressed and reinforced in the Sicily CORE-PLAT, together with those enablers proposed by the Pilot, to generate opportunities to facilitate coastal restoration. The following most relevant and frequent technical enablers, which were less relevant but same frequent than the previous ones, were the "implementation and planning with a safe operating physical space" as well as less frequent but same relevant the "advanced forecasting models that support connectivity restoration".

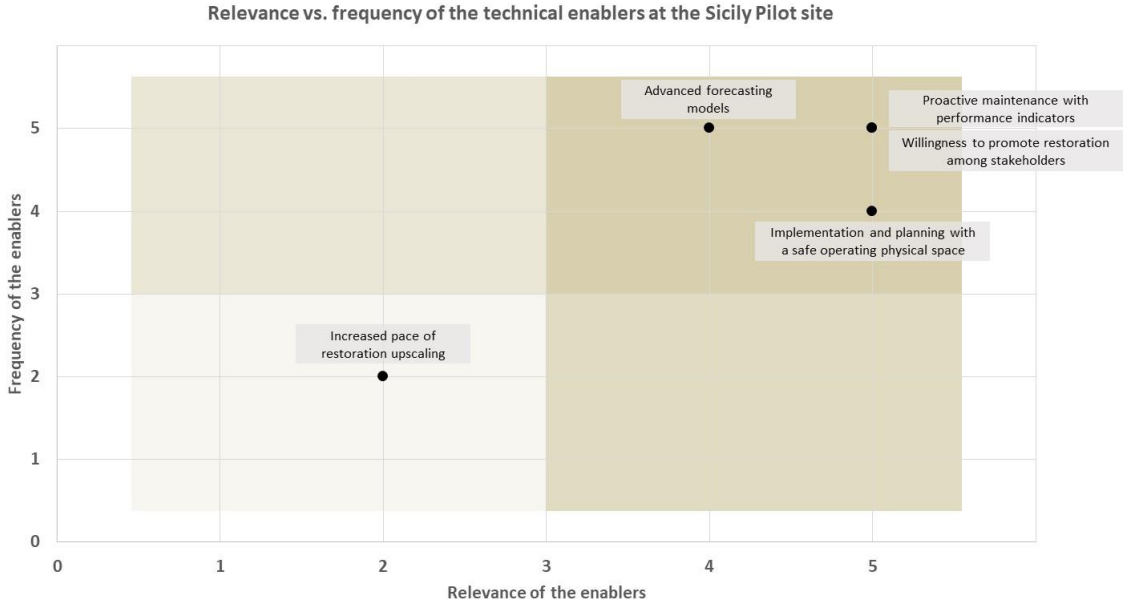

Figure 42. Relevance and frequency of the technical enablers at the Sicily pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Sicily pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 43). The "**proactive maintenance with performance indicators**" was considered the technical enabler with the highest scores of connections to governance and financial enablers so these is being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling.

Table 43

A summary of the total connections (strong and weak) between each of the technical enablers of the Sicily pilot site and governance and financial enablers.

		Sicily Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	**Proactive maintenance with performance indicators**	Willingness to promote restoration among stakeholders
Governance enablers	STRONG connections	2	2	4	4	4
	WEAK connections	0	2	0	2	1
Financial enablers	STRONG connections	0	0	0	0	0
	WEAK connections	0	0	0	0	0
	Score of STRONG connections between enablers	2	2	4	4	4
	Score of WEAK connections between enablers	0	2	0	2	1
	Total score of connections between enablers	**2**	**4**	**4**	**6**	**5**

7.2.7.5 Closing remarks

- **Governance was considered by all SHs to be the main barrier category for coastal restoration in the Sicily Pilot, while also being the main enabler category**. Conflicts between local socio-economic interests and environmental restoration proposals are frequent at this pilot site. However, a key enabler was the presence of advocacy groups, usually NGOs, that pushed either the regional government or other bodies.
- **At the Sicily pilot site, there was a high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. The highest coincidence between the perspectives of both groups was found in the governance barriers and enablers.
- **Most of the highly relevant barriers were governance (41%)**, while 35% were technical and 24% financial. In addition, **among the highly relevant barriers, 100% were diagnosed as highly frequent**, always appearing while developing restoration in the Sicily Pilot.
- **Considering the most relevant and frequent barriers in the Sicily Pilot, more than half of these (57%) were governance barriers**. Thus, the main governance barriers for the Pilot were the "lack of integrated approach", the "limitations in coordinated decision making", the "lack of laws and policies engaging conservation, management and restoration of natural environments" and the "bureaucratic issues or delays in authorising the work or receiving work permits".
- **The most relevant and frequent technical barrier was** the "**lack of data and metrics for ecosystem services, ecological processes and functions**" that was also detected by 60% of the SHs and which in turn was one of the technical barriers with the highest number of connections with governance and financial barriers. Therefore, this barrier should be addressed as a priority in this Pilot and its CORE-

PLAT, as it may become a strong impediment to coastal restoration at this pilot site. In addition, it is worth noting that the technical barrier "**physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**" was a very relevant barrier and occurs with a relatively frequency at the overall REST-COAST project, but it was perceived to be much less relevant and frequent for the Sicily Pilot.

- **Most of the highly relevant enablers were technical (40%) and governance (40%) and, among the highly relevant enablers, 70% were diagnosed as highly frequent**, facilitating the development of restoration in the Sicily Pilot. Considering the most relevant and frequent enablers in the Sicily Pilot, the highest priority belongs to the following technical enablers: the "**willingness to promote restoration among stakeholders**", which was detected by 60% of the SHs of this pilot site, and the "**proactive maintenance with performance indicators**". This last enabler was one of those technical enablers that had highest scores of connections to governance and financial enablers so these is being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling. At the governance level, the most relevant and frequent enabler was the one proposed by the Pilot, the "**advocacy group actions (usually NGO's)"**. On the contrary, the SHs highlighted the financial enabler "increasing restoration funding", detected by 70% of them.

7.2.8 Arcachon Bay Pilot - barriers and enablers local report

7.2.8.1 Pilot context

Pilot regional context[16]

This pilot focuses on the restoration of *Zostera noltii* seagrass meadows in Arcachon bay, which is the largest *Zostera noltii* area in Europe. Their approach is based on the control of hydrodynamics, and is being conducted in three phases: firstly, a small-scale experiment to calibrate their Roseliere modules, followed by their mid-scale settlement (to support the recovery of *Zostera* at 1ha scale.), and finally, the last stage would be the large-scale restoration plan at the basin scale.

Currently, approximately 70-80% of the coast is urbanized, which has impacts on water quality due to soil sealing and changes in water and sediment circulation. In addition, there are several grey structures that have been settled to protect expanding cities, and that also impair the circulation of flows in the Basin. Another problem is the presence of an important oyster farming, which is participating in local employment and value creation. However, this activity has an impact on the water quality and flow pattern in the basin; since oyster tables affect water circulation, and they have a detrimental effect on the areas suitable for Zostera recovery.

Regarding the complex governance context, it is defined as well-established, with several SHs sharing scope and responsibilities, as well as several commissions and committees. This is an advantage in terms of management, but it can be complex to pursue innovation and large-scale restoration. There are several SHs on board and reassured about the impacts of these approaches. For instance, the ecological restoration is within the PNMBA's scope, but benefits may also be derived from other local governance units. For instance, the PNMBA's actions will include seagrasses, but they must contribute to the control of erosion and submergence, which is part of the scope of the Arcachon Basin Intermunicipal Syndicate (SIBA) (and not PNMBA). However, SIBA does not currently operate in Zostera meadows.

As for the financial context, there is a local paradigm, since the PNMBA is responsible for managing and restoring the seagrass meadows, but they lack the budget to achieve it. In addition, there are local needs for an increase in some benefits that could come from seagrass restoration, but these governance units do not have a budget dedicated to seagrass restoration, as it is the purview of the PNMBA. Finally, device settlement is becoming expensive due to material and transportation costs.

Pilot current situation regarding barriers and enablers for coastal restoration

The technical barriers of the Arcachon Bay pilot site are mainly the lack of feedback on the efficiency of ecological restoration in *Zostera* species, as well as a lack of understanding of the biology of the species, their environmental needs, and their development cycle. Furthermore, the crucial issue of hydrodynamics can be complex due to the environmental complexity of the site, as the local context and characteristics are variable. Additionally, the area has several uses (tourism, oyster farming, navigation, urbanization, fishing, etc.), which can pose several challenges and barriers to restoration. On the contrary, the mitigation of hydrodynamics is one of the main enablers, and research is being carried out on the most relevant conditions for this enabler to enhance and ensure the recovery of seagrasses. Finally, work is underway to increase seagrass restoration and use the ESS valuation to support part of the cost of restoration. Recent calls for coastal restoration (Green Deal) are a clear enabler to boost local restoration efforts.

The CORE-PLAT Status

[16] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

CORE-PLAT members

Five SHs were identified and contacted in this pilot site, among which four were engaged to constitute the CORE-PLAT. Three of them are Government bodies with a high potential of influencing the results of the actions: the local Water agency, the Marine Natural Park of the Arcachon Basin, and the Arcachon Basin Intermunicipal Syndicate (SIBA). The Natural Park manages the protected area that includes the pilot site and leads another project for the restoration of the *Zostera* meadows on the site; and the SIBA manages the entire Arcachon Basin area in terms of environment, activities, land-use planning, etc. This entity actively participates and is interested in obtaining tools to help/support decision-making processes (see Figure 43). The incorporation into the CORE-PLAT of the Arcachon Aquitaine Regional Shellfish Farming Committee (CRC), which represents the main socio-economic activity on the Arcachon basin (oyster farming), is being considered.

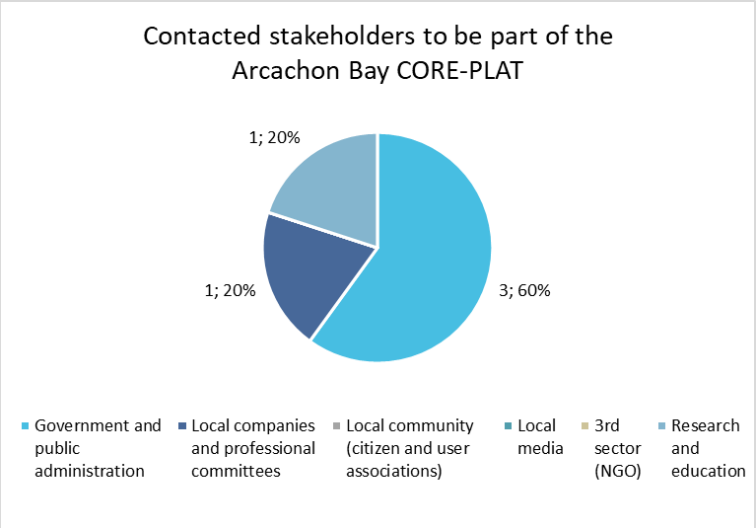

Figure 43. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Arcachon Bay Pilot in November 2022 (information retrieved and adapted from the M 1.3).

Developed activities[17]

In September 2022, the first annual workshop was held with all the SHs involved, with the aim of informing them about the progress and results of the project and involving them in the selection of suitable areas for large scale restoration and the design of a tool to support decision-making processes. In the future, bilateral meetings with SHs will be planned to discuss specific issues on restoration or land use planning, in the perspective of large-scale restoration.

7.2.8.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

Considering the results of the pre-diagnosis with Pilots**,** it was stated that this Pilot had many meetings with the four main SHs that already collaborated with the local government bodies, with the goal of discussing barriers and enablers for coastal restoration projects in their CORE-PLAT (or with the SHs). They also stated that they felt a good level of comfort in terms of filling out a form on barriers and enablers for coastal restoration in their pilot case with their own information (expert judgment) and integrating some SHs perspectives.

Key stakeholders' perspectives on barriers and enablers

In this case, there is no information available from the SHs' perspectives.

[17] The information has been gathered for a preliminary understanding of the Pilot' state of art, as a knowledge input for the unfolding of D1.2

7.2.8.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Arcachon Pilot in two main dimensions. The first section includes the **new barriers proposed by the Pilot** according to their perspective in addition to the 25 barriers proposed in the submitted form. Secondly, there is the representation of the results of the quantitative analysis in which the barriers were prioritized according to relevance and frequency determined by the Arcachon Bay Pilot. Finally, in the last part of this section, the connections between the technical barriers with the financial and governance ones were analysed.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

For this Pilot, there was scarce information available to conduct the analysis of the degree of coincidence of the barriers identified in the Arcachon Bay pilot site, by integrating the SHs' perceptions in the Pilot analysis. Information on the SHs perspectives on the barriers identified in this pilot site is not available.

The following barriers proposed by the Pilot provide remarkable information about the reality of the region. Those are:

Technical

- "High spatial variation in local contexts (flow velocities and directions, waves heights, sediment types, …)".

Governance

- "Dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems".

Financial

- "Ecological restoration mostly relies on regional/national grants to local MPA, that do not rely on ROI to fund additional actions and has no resources to get these additional fundings".
- "Stakeholders that might have the budget to support large scale restoration actions for ESS production are not decision-making on the strategy for ecosystem management in the area".

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the barriers in this Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 32 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 17 (53%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 15 (47%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and governance, with 42% technical, 29% governance, while another 29% were financial barriers (Figure 44).

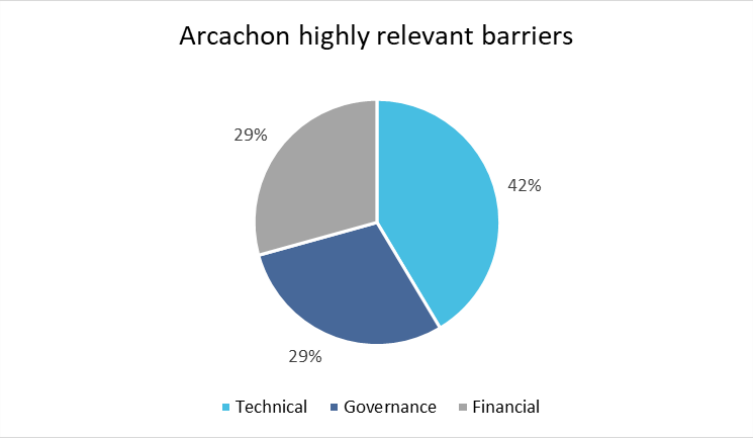

Figure 44. Highly relevant technical, governance and financial barriers in the Arcachon Bay pilot site.

Frequency of the barriers

The value of the frequency of the barriers is between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 17 highly relevant barriers), 71% (n=12) were diagnosed as highly frequent. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area. Those are the most relevant and frequent:

- "High spatial variation in local contexts (flow velocities and directions, waves heights, sediment types, etc.)".
- "Dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems".
- "Lack of data and metrics for ecosystem services, ecological processes and functions".
- "Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)".
- "Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)".
- "Low benefit-cost ratios (or a lack of cost-benefit evaluation)".
- "Short term and small-scale bias".
- "Acute degradation level and divergence in target state".
- "Insufficient restoration pace/scale with uncertain benefits and trade-offs".
- "Lack of convergence in stakeholders' interests".
- "Lack of long-term economic support".
- "Stakeholders that might have the budget to support large scale restoration actions for ESS production are not decision-making on the strategy for ecosystem management in the area".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Arcachon Bay Pilot (scored with a value of 5 in relevance and frequency), the most important technical barrier in this pilot site was the "**high spatial variation in local contexts**" which was proposed by the Pilot (not included in the form). In addition, the main governance barrier was the "**dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems**", which was also proposed by the Pilot.

The following table (see Table 44) contains the list of all the barriers identified by the Arcachon Bay Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In addition, the relevance and frequency scores of the Arcachon Bay Pilot were compared with the REST-COAST average of each of the barriers. This comparison integrates the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the two barriers highlighted above (scored with a value of 5 in relevance and frequency), as they were proposed by the Pilot, their scores could not be compared with the REST-COAST average to assess these barriers in the global framework of all Pilots. Despite this, considering that they are the most relevant and frequent barriers for this Pilot, these barriers are the ones that should be established as a priority to be addressed in the Arcachon Bay Pilot and its CORE-PLAT.

In addition, it is also worth to mention higher deviations for other barriers in this Pilot that were less aligned with the REST-COAST global trends, as "**difficulties related to management plans**", that was a relevant technical barrier that occurs, or it was perceived to occur, much less frequently in the Sicily Pilot (SD 1.4) than in the overall project consortium. In addition, the governance barrier "**Focus on short term policies**" was perceived to be much less relevant (SD 1.6) and frequent (SD 1.7) for the Arcachon Bay Pilot compared to the rest of the Pilots in the project.

Table 44

Ranking of the total barriers for coastal restoration upscaling identified by the Arcachon Bay Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 Pilots of the project as well as the standard deviation of the Arcachon Bay Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Arcachon Bay pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Arcachon Bay pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	Proposed barriers	High spatial variation in local contexts (flow velocities and directions, waves heights, sediment types, ...	5	-	-	5	-	-
Governance barriers	Proposed barriers	Dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems	5	-	-	5	-	-
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	5	4.3	0.5	4	3.7	0.2
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	4	3.9	0.1
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	3	3.8	0.5
Governance barriers	General barriers	Dealing with socioeconomic needs	5	4.2	0.5	3	4.2	0.9
Financial barriers	Proposed barriers	Ecological restoration mostly relying on regional / national grants to local MPA, that do not rely on ROI to fund additional actions, and has no resources to get these additional fundings	5	-	-	3	-	-
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	4	3.0	0.7	5	3.1	1.3
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	4	4.2	0.2	5	3.9	0.8
Financial barriers	General barriers	Short term and small-scale bias	4	3.8	0.2	5	3.9	0.8
Technical barriers	Further barriers	Acute degradation level and divergence in target state	4	3.4	0.4	4	3.6	0.3
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	4	3.1	0.6	4	3.6	0.3
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	4	3.9	0.1	4	4.2	0.2
Financial barriers	General barriers	Lack of long-term economic support	4	4.6	0.4	4	4.6	0.4
Financial barriers	Proposed barriers	Stakeholders that might have the budget to support large scale restoration actions for ESS production are not decision-making on the strategy for ecosystem management in the area	4	-	-	4	-	-
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	4	3.7	0.2	3	3.4	0.3

Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	4	4.0	0.0	2	4.0	1.4
Financial barriers	General barriers	Low SHORT-TERM returns from investments	3	3.9	0.6	4	3.4	0.4
Financial barriers	General barriers	Business plans bound to local constraints	3	3.2	0.2	4	2.9	0.8
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	3	3.1	0.1	3	3.0	0.0
Governance barriers	General barriers	Lack of social engagement in restoration activities	3	3.3	0.2	2	3.3	0.9
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	3	2.8	0.2	2	2.9	0.6
Technical barriers	General barriers	Lack of data and metrics for biodiversity	2	3.1	0.8	4	2.8	0.9
Governance barriers	General barriers	Limitations in coordinated decision making	2	3.4	1.0	3	3.6	0.4
Technical barriers	General barriers	Delayed performance of restoration projects	2	2.6	0.4	2	2.6	0.4
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	2	3.0	0.7	2	3.1	0.8
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	2	3.4	1.0	2	3.4	1.0
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	2	3.6	1.1	2	3.4	1.0
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	1	2.8	1.3	2	3.1	0.8
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	1	2.9	1.3	1	2.2	0.9
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	1	2.6	1.1	1	1.9	0.6
Governance barriers	General barriers	Focus on short term policies	1	3.3	1.6	1	3.4	1.7

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of barriers according to these parameters to detect which barriers which should be prioritized in the coastal restoration upscaling in the Arcachon Bay pilot site (Figure 45). In the upper right quadrant, the technical barriers with the highest scores were collected. The "**high spatial variation in local contexts**" as well as the "**lack of data and metrics for ecosystem services, ecological processes and functions**" and the "**physical context specific of the site**" had the greatest relevance for the Pilot and occur more frequently, which need to be addressed and reinforced in the Arcachon Bay CORE-PLAT to facilitate coastal restoration. It is also worth highlighting the following barriers due to their frequent occurrence, although they were considered less relevant than the previous ones by the Pilot: the "mismatch between socioeconomic needs and restoration works", the "acute degradation level and divergence in target state" and the "insufficient restoration pace/scale with uncertain benefits and trade-offs".

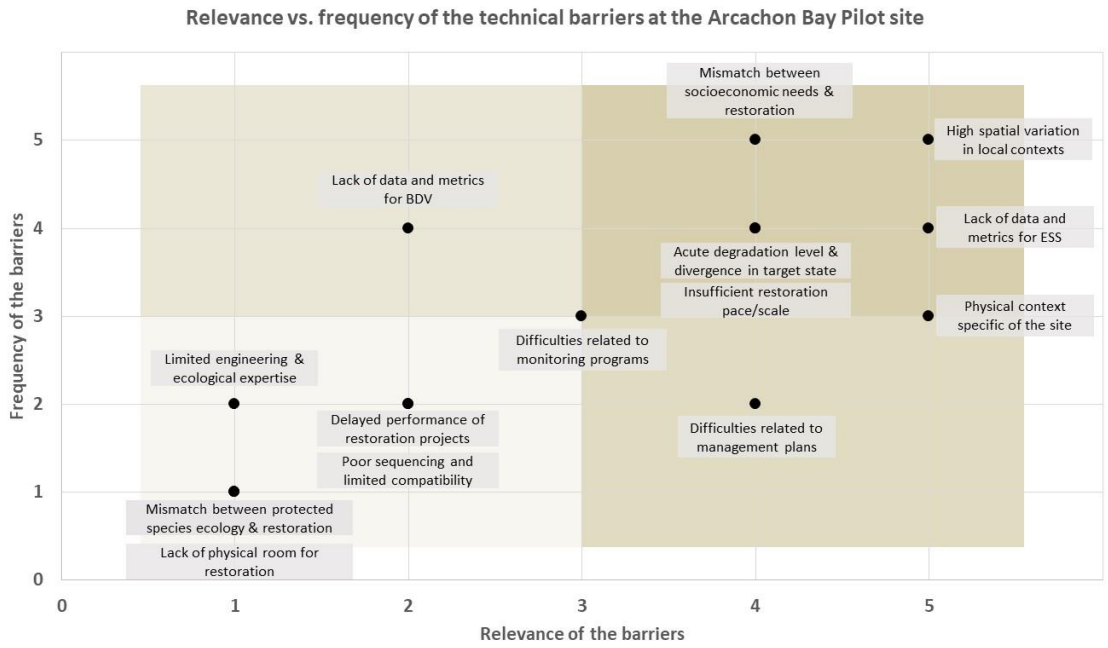

Figure 45. Relevance and frequency of the technical barriers at the Arcachon Bay pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical barriers of the Arcachon Bay Delta pilot site with the governance and financial ones were analysed considering the Pilot perspective. In this case, the new barriers proposed by the Pilot were not integrated in this analysis of connections. Firstly, for each of technical barriers identified by the Pilot (those included in the form), the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 45). The "**lack of data and metrics for ecosystem services, ecological processes and functions**" and the "**physical context specific of the site**" were considered the technical barriers with the highest score of connections to governance and financial barriers. A greater number of connections with other governance and financial barriers may lead to an amplification of the "barrier effect" of these technical barriers. Thus, these barriers should be addressed as a priority, as these may become a stronger impediment to coastal restoration.

Table 45

A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Arcachon Bay pilot site.

		Arcachon Bay Pilot												
		TECHNICAL BARRIERS												
		General barriers										Further barriers		
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	**Lack of data and metrics for ecosystem services, ecological processes and functions**	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	Delayed performance of restoration projects	Lack of physical room for restoration e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and trade-offs	Poor sequencing and limited compatibility with existing infrastructure	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	**Physical context specific of the site e.g., terrain typology, watershed, hydrological context, sand availability…**
Governance barriers	**STRONG connections**	12	6	14	0	10	0	0	8	10	0	10	12	16
	WEAK connections	3	6	2	9	4	9	9	5	4	9	4	3	1
Financial barriers	**STRONG connections**	10	4	12	12	10	0	0	12	12	0	4	0	10
	WEAK connections	1	4	0	0	1	6	6	0	0	6	4	6	1
	Score of STRONG connections between barriers	22	10	26	12	20	0	0	20	22	0	14	12	26
	Score of WEAK connections between barriers	4	10	2	9	5	15	15	5	4	15	8	9	2
	Total score of connections between barriers	**26**	**20**	**28**	**21**	**25**	**15**	**15**	**25**	**26**	**15**	**22**	**21**	**28**

Within the context of the Archachon Bay Pilot, it is essential to highlight that the proposed barriers by the Pilot (present in the Table 44), were not considered and scored in the table of connections (Table 45). Therefore, most of the relevant and frequent barriers – which were those proposed by the Pilot – were not connected to other governance and financial barriers that could hamper restoration. Thus, at some point the exercise present in the Table 45, could generate misconceptions and deviations because not all the barriers were included.

7.2.8.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Arcachon Bay Pilot. The first section includes the **new enablers proposed by the Pilot** according to their perspective in addition to the 13 enablers included in the submitted form. Secondly, there is the representation of the results of the quantitative analysis in which the enablers were prioritized according to relevance and frequency determined by the Arcachon Bay Pilot. Finally, the connections between the technical barriers with the financial and governance ones were analysed.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

For this Pilot, there was scarce information available to conduct the analysis of the degree of coincidence of the enablers identified in the Arcachon Bay pilot site, by integrating the SHs perceptions in the Pilot analysis. Information on the SHs perspectives on the enablers identified in this pilot site is not available.

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The following enablers proposed by the Pilot provide remarkable information about the reality of the region. Those are:

Technical

- Master local conditions and pressure to enable key species settlement and resilience.

Financial

- Innovative model to value ecosystem services for local stakeholders and to initiate restoration upscaling beyond the objectives of biodiversity restoration only.

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Arcachon Bay Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 15 enablers were diagnosed and scored, including technical but also financial and governance ones.
- A total of 11 enablers (73%) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 4 enablers (27%) were less relevant (between 1 and 3).
- From the highly relevant enablers, the technical account for 46%, financial ones were 27%, as well as governance ones 27% (Figure 46).

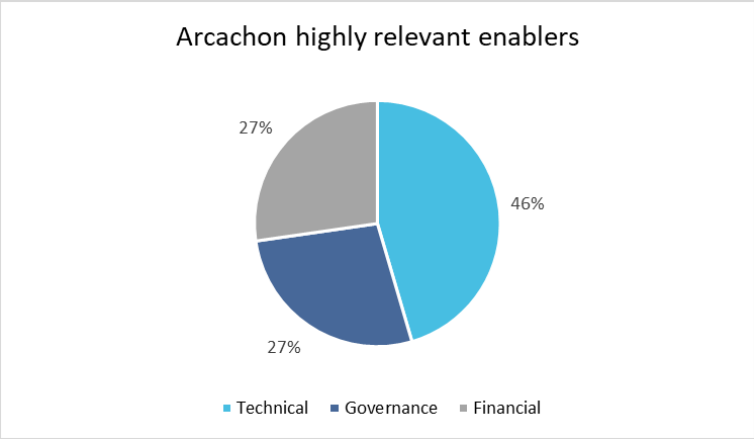

Figure 46. Highly relevant technical, governance and financial enablers in the Arcachon Bay pilot site.

Frequency of the enablers

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 11 highly relevant enablers), 73% (n=8) were diagnosed as highly frequent, facilitating the development of restoration in the Arcachon Bay Pilot. Those are the most relevant and frequent:

- "Master local conditions and pressure to enable key species settlement and resilience".
- "There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)".
- "Innovative value-capture instruments and business models".
- "Innovative model to value ecosystem services for local stakeholders and to promote restoration upscaling beyond the objectives of biodiversity restoration only".
- "New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)".
- "Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)".
- "Improved capacity to develop business models and bankable plans".
- "Proactive maintenance with performance indicators".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Arcachon Bay Pilot (scored with a value of 5 in relevance and frequency), the highest priority corresponded to the technical enabler "**master local conditions and pressure to enable key species settlement and resilience**", while at the governance level was "**there are multi-level governance mechanisms**". At the financial level, the enablers were the "**innovative value-capture instruments and business models**" and the "**innovative model to value ecosystem services for local stakeholders and promote restoration upscaling beyond the objectives of biodiversity restoration only**".

The following table (see Table 46) contains the list of all the enablers identified by the Arcachon Bay Pilot (including their own proposals), ordered from most to least relevant and then, by frequency with which they occur, from most to least frequently. In addition, the relevance and frequency scores of the Arcachon Bay Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. As two of the most relevant and frequent enablers were proposed by the Arcachon Bay Pilot, their scores could not be compared with the REST-COAST average to assess these enablers in the global framework of all Pilots. The other two enablers scored with 5, "there are multi-level governance mechanisms" and the "innovative value-capture instruments and business models" were perceived as very relevant (SD 1.2 and 1.3, respectively) and frequent (SD 1.3 and 1.5, respectively) contrasting with the situation in other REST-COAST Pilots. Furthermore, it is worth to highlight the financial enabler "**improved capacity to develop business models and bankable plans**" that was perceived as relevant (SD 1) and very frequent (SD 1.6) enabler in the Arcachon Bay Pilot contrasting with the situation in other Pilots. Thus, to promote this last enabler in other REST-COAST Pilots, considering the experience and lessons that can be learned from the Arcachon Bay Pilot, could be a valuable opportunity to facilitate coastal restoration in the different pilot sites.

Table 46

Ranking of the total enablers for coastal restoration upscaling identified by the Arcachon Bay Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 Pilots of the project as well as the standard deviation of the Arcachon Bay Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Arcachon Bay pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Arcachon Bay pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	Proposed enablers	Master local conditions and pressure to enable key species settlement and resilience	5	-	-	5	-	-
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	5	3.3	1.2	5	3.1	1.3

Financial enablers	General enablers	Innovative value-capture instruments and business models	5	3.2	1.3	5	2.9	1.5
Financial enablers	Proposed enablers	Innovative model to value ecosystem services for local stakeholders and to promote restoration upscaling beyond the objectives of biodiversity restoration only	5	-	-	5	-	-
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	5	3.4	1.1	4	2.7	0.9
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	5	3.9	0.8	3	3.8	0.5
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	4	4.0	0.0	5	3.4	1.1
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	4	2.6	1.0	5	2.7	1.6
Technical enablers	General enablers	Proactive maintenance with performance indicators	4	3.2	0.5	4	2.4	1.1
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	4	3.2	0.5	3	2.3	0.5
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	4	2.9	0.8	1	2.6	1.1
Financial enablers	General enablers	Increasing restoration funding	3	3.4	0.3	3	2.6	0.3
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	3	2.8	0.2	2	2.2	0.2
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	2	2.7	0.5	2	2.8	0.5
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	2	3.2	0.9	2	2.3	0.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, to have the distribution of enablers according to these parameters where detecting which enablers which should be prioritized to become an opportunity for coastal restoration upscaling in the Arcachon Bay pilot site (Figure 47). In the upper right quadrant, the technical enablers with the highest score were collected. The technical enabler proposed by the Pilot "**master local conditions and pressure to enable key species settlement and resilience**" was scored with the highest relevance and frequency, which means that it should be addressed and reinforced in the Arcachon Bay CORE-PLAT to generate opportunities and facilitate coastal restoration. The next most relevant technical enabler, which was as relevant as the previous one although less frequent, was the "**willingness to promote restoration among stakeholders**". The "**advanced forecasting models that support connectivity restoration**" was also a highly relevant enabler although less frequent.

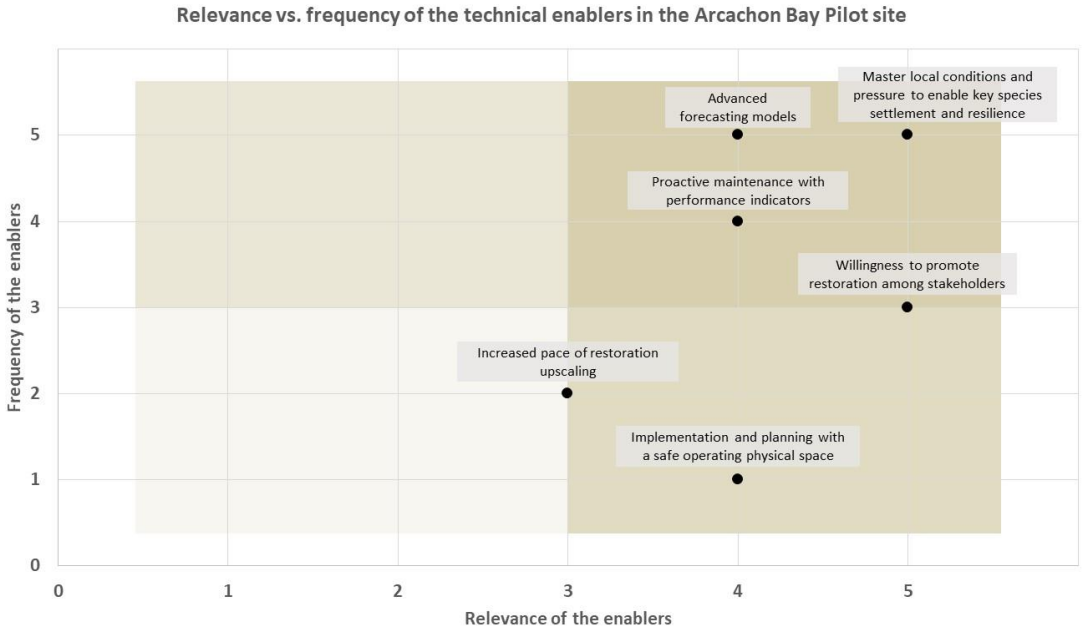

Figure 47. Relevance and frequency of the technical enablers at the Arcachon Bay pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Arcachon Bay pilot site with the governance and financial ones were analysed considering the Pilot perspective. In this case, the new enablers proposed by the Pilot were not integrated in this analysis of connections. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 47). The "**advanced forecasting models that support connectivity restoration**" and the "**willingness to promote restoration among stakeholders**" were considered the technical enablers with the highest scores of connections to governance and financial enablers so these are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling.

As mentioned above in the barriers section, it is essential to highlight that the proposed enablers by the Arcachon Bay Pilot (present in the Table 46), were not considered and scored in the table of connections (see Table 47). Some of the relevant and frequent enablers – which where those proposed by the Pilot – were not connected with other governance and financial barriers that could facilitate restoration. Thus, at some point the exercise present in the Table 47 could generate misconceptions and deviations because not all the enablers were included.

Table 47

A summary of the total connections (strong and weak) between each of the technical enablers of the Arcachon Bay pilot site and governance and financial enablers.

Arcachon Bay Pilot

		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	**Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)**	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	Proactive maintenance with performance indicators	**Willingness to promote restoration among stakeholders**
Governance enablers	**STRONG connections**	8	2	2	4	6
	WEAK connections	1	4	4	3	2
Financial enablers	**STRONG connections**	2	0	0	0	0
	WEAK connections	2	3	3	3	3
	Score of STRONG connections between enablers	10	2	2	4	6
	Score of WEAK connections between enablers	3	7	7	6	5
	Total score of connections between enablers	**13**	**9**	**9**	**10**	**11**

7.2.8.5 Closing remarks

- This Pilot has a complex governance context, but it is defined as well established, with several SHs sharing scope and responsibilities, as well as several commissions and committees. However, for this Pilot, no information was available from the SHs' perspectives for the present analysis. For this reason, it was not possible to analyse the level of agreement between the perspectives of the Pilot and the SHs regarding the barriers and facilitators of restoration.
- **Most of the highly relevant barriers in the Arcachon Bay Pilot were technical (42%)**, in contrast to governance (29%) and financial (29%) barriers. In addition, **among the highly relevant barriers, 71% were diagnosed as highly frequent**. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area.
- **Considering the most relevant and frequent barriers in the Arcachon Bay Pilot, half of these were technical barriers (50%) and the other half were governance ones (50%)**. The technical barrier was "**high spatial variation in local contexts**" which was proposed by the Pilot; while the main governance barrier was the "**dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems**", which was also proposed by the Pilot.
- In addition to the barriers mentioned above, the technical barriers "**lack of data and metrics for ecosystem services, ecological processes and functions**" and the "**physical context specific of the site**" had a highly relevance for the Pilot although they occurred less frequently than the previous ones. These technical barriers were the barriers that the highest number of connections with other governance and financial barriers being those are amplified by these types of barriers. In the analysis of connections between barriers, the proposed barriers by the Pilot were not included and scored.
- **Most of the highly relevant enablers were technical (46%) and, among the highly relevant enablers, 73% were diagnosed as highly frequent**, facilitating the development of restoration in the Arcachon Bay. The technical enabler proposed by the Pilot "**master local conditions and pressure to enable key species settlement and resilience**" was scored with the highest relevance and frequency, followed by the "**willingness to promote restoration among stakeholders**" and the "**advanced forecasting models that support connectivity restoration**", which were also a highly relevant enablers although less frequent. These two last enablers were considered the technical enablers with the highest scores of connections to governance and financial enablers so these are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling in this pilot site.

7.2.9 Nahal Dalia Pilot - barriers and enablers local report

7.2.9.1 Pilot context

Pilot regional context[18]

This pilot site includes coastal marshland and islands for nesting birds. The restoration goal is to restore 30 ha. The actions that will be conducted consist of a dam removal, a geomorphic restoration of banks waterbodies, the recovery of the Ecological system by Fishpond effluents mitigation and water abstraction, the rejuvenation of macrophytes and sea grass to promote carbon sequestration.

These restoration actions could potentially have a detrimental effect on the fishery; as stated by the Pilot, "previous attempts to improve the condition of the reserve encountered obstacles regarding the fishponds, mainly because the water body of the reserve is still used as an operational reservoir". Disconnecting the reserve and the fishery has economic implications for the fishery and therefore could harm a significant source of income for the "kibbutz". Thus, the Pilot highlighted the fact that changing the current "*status quo"* needs to come with financial alternatives from which SHs could benefit from.

Pilot current situation regarding barriers and enablers for coastal restoration

The Pilot view on barriers and enablers is that the most two significant barriers are probably the financial and governance barrier. This is because they believe that there is complexity in creating economic value for the SHs in an area undergoing ecological restoration. As stated by the Pilot "if the restoration project will affect the land use definition and will change it from agriculture to non-cultivation, there is a risk that the land lease contract of the kibbutz will be affected". This is both a technical governance and financial issue the project needs to address.

Thus, restoration often hinders development that could be a source of income. There are complexities in terms of defining the actual financial value that local SHs can gain. It is relevant that the undervaluation of the benefits of restoration projects often has a large time-lag between implementation and delivery of full benefits, and therefore has limited influence on economic decisions.

The Pilot highlighted the issue that land is a scarce resource, especially in the coastal plain. Therefore, the process of ecological restoration or rewilding is subjected to objections and should generate value for local and regional SHs. There are other difficulties related to management plans, since there are multiple SHs in relatively small areas and thus, consensus is hard to reach.

Regarding technical barriers, the Pilot stated that there are a few new studies regarding climate change effects on their pilot site area, and they do not currently affect local decision-making processes. Additionally, since water resources belong to the State, the Pilot is currently in the process of getting water allocation for the Dalia stream.

Nevertheless, there are potential enablers, especially since the Pilot shed light into their experience in terms of establishing watershed partnerships in several locations, promoting multiple ecosystem services and beneficiaries' restoration. Another potential enabler would be by means of the local municipality, which is currently working on a strategic plan for protecting and developing their coastal area. Thus, this plan could be a good platform for outscaling and upscaling their work.

[18] The following information has been gathered from the Pilot's contribution to the current deliverable, as well as from the background context provided on the "REST-COAST common questionnaire for Pilots initial data gathering", led by REST-COAST coordinators.

The CORE-PLAT Status

CORE-PLAT members

Initially, in March 2022, the efforts to engage SHs focused on the ones that are considered more influent: eight SHs out of eighteen actors identified were already on board and all of them are believed to be very powerful. They include local and governmental authorities (the basin authority of Camel drainage and streams, Israel Nature and Parks Authority, the National Water Authority), a local Kibbutz (which may play multiple roles, but in this case is involved as an organization of landowners and managers), and the Reichman University and some influent private organizations like a fish farm operator and an agricultural water association. Three more influent actors were contacted but not yet engaged: the first is a private philanthropic organization which may play a role as a neutral third party for leading public participation aspects; the others are a Kibbutz and the Israel Antiques Authority which may act as enabler and concede field work authorizations.

Thus, the CORE-PLAT (Figure 48) was constituted by four public government organs and public administration (65%), being the dominant group. Some third sector entities represent a low proportion (12%). Local companies and professional committees (17%). Finally, the local media represent only a very low proportion (6%).

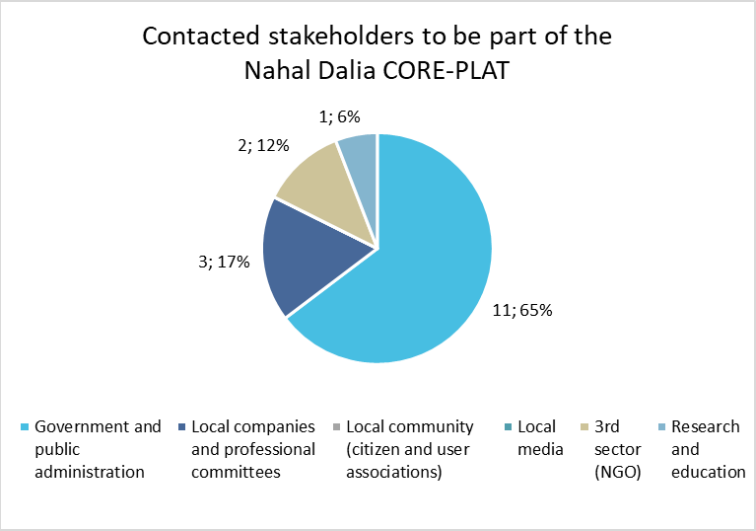

Figure 48. Contacted and engaged stakeholders to constitute the CORE-PLAT of the Nahal Dalia Pilot in November 2022 (Information retrieved and adapted from the M 1.3).

Developed activities[19]

The following section contemplates the status of the CORE-PLAT in the Nahal Dalia context. The first SHs kick-off meeting took place in March 2022, with the aim of presenting the project and involving the participating entities. In the second meeting, in August 2022, a Steering Committee was established, formed by the most powerful actors of the territory and with the highest interest in the project. The committee met again in October for a tour on-site and a workshop to make a survey on the field after the initial research phase. Also, the aim was to check for additional conflicts that had not been addressed yet. The Steering Committee will gather every few months and will take part in core decision making.

[19] The information has been gathered for a preliminary understanding of the pilot' state of art, as a knowledge input for the unfolding of D1.2

7.2.9.2 Preliminary approach to address barriers and enablers

Pre-diagnosis with Pilots

The Pilot stated the fact that so far, they received input from the steering committee ("Veto players") which was very helpful. Nevertheless, they claimed that they were not successful in reaching out to their main SH, the landowners (Kibbutz "Maayan Tzvi"). However, they highlighted the fact that they were working close with them to offer them financial benefits, in exchange of necessary restoration changes (relocating/removing the dams, disconnecting the fishponds and the nature reserve, offering additional areas for restoration or carbon sequestration).

At the time when the pre-diagnosis form was sent, this Pilot stated that they had carried out bilateral meetings and a workshop with SHs to discuss barriers and enablers for coastal restoration projects in their CORE-PLAT. They also stated the fact that they felt a low degree of comfortability (2 out of 5) in terms of filling a request on barriers and enablers for coastal restoration in their pilot case with their own information (expert criteria) also considering some SH's perspectives.

Key stakeholders' perspectives on barriers and enablers

In the Nahal Dalia Pilot, the above-mentioned form was answered by 5 SHs. The respondents represent some of the invited groups: the Government and public administration, local companies and professional committees and the research and education (Figure 49). The research and education group with government and public administration had the greatest participation (40% each group).

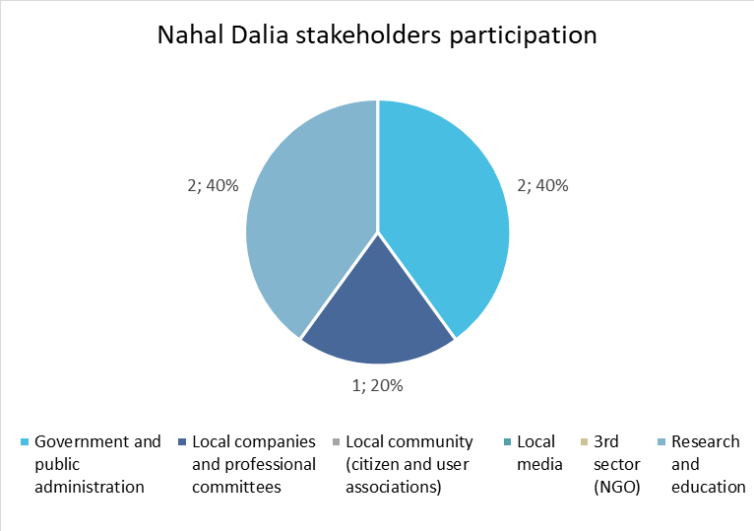

Figure 49. Key local stakeholders of the Nahal Dalia Pilot that participated in the form.

On average, the Nahal Dalia Pilot claimed to feel comfortable in terms of discussing barriers and enablers in the CORE-PLAT (average score is 4.6 on five-point scale). This perception might enhance the discussion in the framework of the REST-COAST project. **Governance was seen by all SHs as the main barrier category to coastal restoration in the Nahal Dalia Pilot, while the main potential enabler category was governance as well**. They agreed with the perception of barriers as a relevant factor that has hampered coastal restoration efforts (average score is 3.8 on a five-point scale). Also, there was consensus regarding the consideration of enablers as a relevant factor that boosted coastal restoration efforts in the pilot area (average score is 3.75 on a five-point scale).

7.2.9.3 Barriers to coastal restoration upscaling

The present section aims to represent the results of the barriers analysed in the Nahal Dalia Pilot in three main dimensions. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 25 barriers proposed in the forms sent to both groups**. Secondly, there is the representation of the results from the quantitative analysis in which the barriers were prioritised according to the relevance and the frequency determined by the Nahal Dalia Pilot. Finally, in the last part of the present section, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides detailed information on the degree of coincidence of the barriers identified in the Nahal Dalia Pilot site, by integrating the SHs perceptions with the Pilot analysis. Both barriers identified and not identified by the Pilot and SHs, the percentage of SHs that identified each of the barriers and the degree of coincidence of the barriers identified by both groups were compiled in the table below (Table 48). The main highlights of this analysis are the following:

- The Pilot and the SHs coincided in 24 of the barriers, which means a higher level of alignment between both perspectives (96%).
- In addition, 13% (n=3) of the identified barriers were highly coincident. These were the barriers identified by the Pilot and at least 50% of the SHs.
- However, in 88% (n=21) the Pilot coincided with less than 50% of the SHs.

Table 48

Identified and unidentified barriers by the Pilot and SHs in the Nahal Dalia pilot site. The identified barriers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence barriers. The percentage of the SHs that identified each barrier is indicated in the table.

		Identified/unidentified barriers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Nahal Pilot level	Nahal SH1: Government and public administration	Nahal SH2: Local companies and professional committees	Nahal SH3: Government and public administration	Nahal SH4: Research and education	Nahal SH5: Research and education	Nahal SHs (%)	Nahal Pilot + SHs coincidence
TECHNICAL BARRIERS	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)							20%	1
	Lack of data and metrics for biodiversity							40%	1
	Lack of data and metrics for ecosystem services, ecological processes and functions							40%	1
	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)							20%	1
	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)							80%	2
	Delayed performance of restoration projects							20%	1
	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)							20%	1
	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)							40%	1
	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)							40%	1
	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)							40%	1

GOVERNANCE BARRIERS	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)							60%	2
	Limitations in coordinated decision making							20%	1
	Lack of social engagement in restoration activities							40%	1
	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)							20%	1
	Focus in short term policies							40%	1
	Lack of convergence in stakeholders' interests							40%	1
	Lack of laws and policies engaging conservation, management and restoration of natural environments							20%	1
	Bureaucratic issues or delays in authorising the work or receiving work permits							40%	1
	Dealing with socioeconomic needs							20%	1
FINANCIAL BARRIERS	Lack of economic resources to invest in restoration actions							40%	1
	Low benefit-cost ratios (or a lack of cost-benefit evaluation)							40%	1
	Low SHORT-TERM returns from investments							60%	2
	Short term and small-scale bias							-	0
	Business plans bound to local constraints							40%	1
	Lack of long-term economic support							40%	1

Highest coincidence

The highest coincidence is shown on the technical barrier of “difficulties related to management plans (e.g., plans still to be defined, lack of consensus)”, which gathered 80% of the SHs from all sectors in agreement with the Pilot.

Proposed barriers

The proposed barriers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

- “A shared definition of the image a success common to all stakeholders”.
- “Long-term ownership of the land (A lease from the government for a specific purpose)”.
- “Possession of the ground”.
- “Difficulty defining the picture of success – under-response to all the needs of the relevant stakeholders”.
- “Possession of the ground, difficulty in defining what the picture of success is – under-response to all the needs of the relevant stakeholders. We have embarked on the project, and the conversation has not yet been built, there are no agreements yet”.
- “There is good experience in reaching broad agreements in the area (a policy document for PV roofing in fishponds and water reservoirs, adopted by a district committee, done in cooperation with many entities in the region). Statutory limitations – the coastal strip on the one hand is very sensitive, on the other hand there is a lot of infrastructure”.
- “Having multiple stakeholders in a relatively small space makes it difficult to agree. Rehabilitation actions are sometimes contrary to the needs of stakeholders. Data on biodiversity and system services is currently lacking”.

Governance

- “The implication of Changing the land use definition (from agriculture to other) on ownership and rights of the stakeholders on the territory”.
- “Public, it has not been defined who the public is”.

- "Bureaucracy – issues of property vis-à-vis the ILA, security activity in open spaces".
- "A sustainable project must include environmental, economic and social components".
- "Public involvement and support are essential for the success of rehabilitation in the short and long term".
- "It is important not to ignore the needs of the public".
- "A planned user survey will address this barrier".

Financial

- "Difficulty in defining the benefits for the stakeholders".
- "Difficulty obtaining budgets for long-term maintenance".
- "Lack of knowledge, experience and regulation support Carbon fixation".
- "Lack of specific economic resources in the drainage authority (ability to support projects), difficulty in defining the benefit".
- "After the restoration activities, the rehabilitated site must be maintained, especially if the site is open to visitors - crowd management includes waste disposal and regular maintenance".
- "The current budget focuses only on reconstruction activities".

Relevance and frequency of the barriers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritisation of the barriers in this Pilot. As a prioritisation criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the barriers

The value of the relevance of the barriers is between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered "highly relevant barriers" while barriers between 1 and 3 were considered "less relevant barriers".

- A total of 34 barriers were identified and valued, including technical but also financial and governance ones.
- A total of 22 (65%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 12 (35%) were less relevant (between 1-3).
- Most of the highly relevant barriers were technical and financial, with 41% technical, 32% financial and 27% governance barriers (Figure 50).

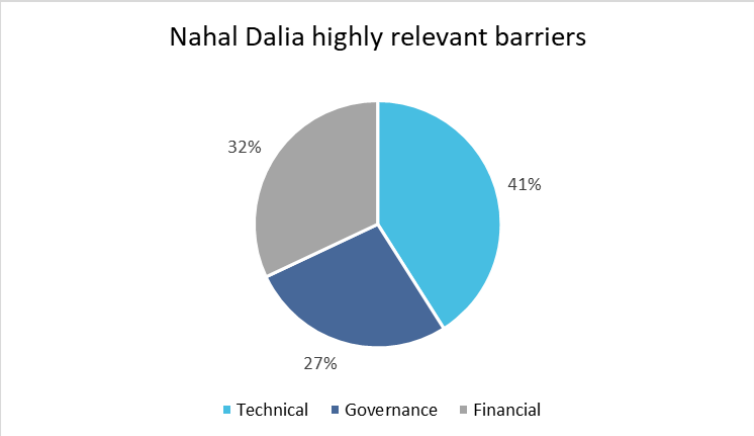

Figure 50. Highly relevant technical, governance and financial barriers in the Nahal Dalia pilot site.

Frequency of the barriers

The value of the frequency of the barriers was between 1 (the Pilot never have to deal with this barrier) and 5 (the Pilot always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent".

From those highly relevant barriers (a total of 22 highly relevant barriers), 73% (n=16) were diagnosed as highly frequent, always appearing while developing restoration in the Nahal Dalia Pilot. The identification of this combination of relevance and frequency in more than half of the restoration barriers may have relevant implications for the future of restoration activities in the area. Those are the most relevant and frequent:

- "Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)".
- "Poor sequencing and limited compatibility with existing infrastructure".
- "A shared definition of the image a success common to all stakeholders".
- "Long term ownership of the land (at lease from the government for a specific purpose)".
- "Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)".
- "Dealing with socioeconomic needs".
- "The implication of changing the land use definition (from agriculture to other) on ownership and rights of the stakeholders on the territory".
- "Lack of long-term economic support".
- "Lack of knowledge, experience, and regulation support Carbon fixation".
- "Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)".

Relevance and frequency of the barriers

Considering the most relevant and frequent barriers in the Nahal Dalia Pilot (scored with a value of 5 in relevance and frequency), it was shown that 9 barriers were found; 4 of which belong to technical, 3 to governance, and 2 to financial (see each of them on the Table 49 Ranking below). There were nine highly relevant and frequent barriers for this Pilot, and it is important to highlight that four of them were proposed barriers from the Pilot (see Table 49). As four of the most relevant and frequent barriers were proposed by the Nahal Dalia Pilot, their scores could not be compared with the REST-COAST average to assess these barriers in the global framework of all Pilots. Despite this, these proposed barriers should also be addressed at the CORE-PLAT of this Pilot.

The following table (Table 49) contains the list of all the barriers identified by the Pilot. They were arranged from along the degree of relevance as well as how frequently the Pilot has been dealing with them. This table also includes the averages at the REST-COAST level of each of the barriers to integrate the present Pilot within the global analysis of the 9 pilots of the REST-COAST project.

Considering the nine more relevant and frequent barriers (scored with a value of 5 in relevance and frequency), the "Poor sequencing and limited compatibility with existing infrastructure" was further from the REST-COAST average in terms of relevance and frequency (SD 1.4 and 1.3, respectively). The "lack of an integrated approach", and "dealing with socioeconomic needs" are closer to the REST-COAST average for relevance (SD 0.7 and 0.5, respectively), and frequency (0.8 and 0.5, respectively). "The difficulties to management plans" are also quite close to the REST-COAST average (SD 0.7 for both relevance and frequency). The closest barrier to the REST-COAST average is the "lack of long-term economic support" (SD 0.3 for both relevance and frequency), it is the financial barrier that is more relevant and occurs more frequently from the Pilot's perspective together with their own financial barrier proposal. It is also worth to highlight higher deviations for other barriers in this Pilot that are less aligned with the REST-COAST global trends, as "**lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic**

infrastructure/activities)" was highly relevant and frequent for this Pilot, but it is far from the global REST-COAST. The same is true for "**lack of laws and policies engaging conservation, management and restoration of natural environments**" for the relevance (SD 1.6). Accordingly, this comparison showed six barriers at the bottom of the table that also had lower relevance and frequency values than expected within the consortium (see Table 49). This may require further discussion in the CORE-PLAT.

Table 49

Ranking of the total barriers for coastal restoration upscaling identified by the Nahal Dalia Pilot, including technical, governance and financial ones. The total barriers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they must deal with them (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the barriers considering the data from the 9 pilot sites of the project as well as the standard deviation of the Nahal Dalia Pilot's score from the REST-COAST average.

Barrier type 1	Barrier type 2	Barrier	RELEVANCE of this BARRIER at the Nahal Dalia pilot site	RELEVANCE of this BARRIER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this BARRIER across restauration actions at the Nahal Dalia pilot site	FREQUENCY of this BARRIER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical barriers	General barriers	Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)	5	4.0	0.7	5	4.0	0.7
Technical barriers	Further barriers	Poor sequencing and limited compatibility with existing infrastructure	5	3.0	1.4	5	3.1	1.3
Technical barriers	Proposed barriers	A shared definition of the image a success common to all stakeholders	5	-	-	5	-	-
Technical barriers	Proposed barriers	Longterm ownership of the land (A lease from the government for a specific purpose)	5	-	-	5	-	-
Governance barriers	General barriers	Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)	5	4.0	0.7	5	3.9	0.8
Governance barriers	General barriers	Dealing with socioeconomic needs	5	4.2	0.5	5	4.2	0.5
Governance barriers	Proposed barriers	The implication of changing the land use definition (from agriculture to other) on ownership and rights of the stakeholders on the territory	5	-	-	5	-	-
Financial barriers	General barriers	Lack of long-term economic support	5	4.6	0.3	5	4.6	0.3
Financial barriers	Proposed barriers	Lack of knowledge, experience and regulation support Carbon fixation	5	-	-	5	-	-
Technical barriers	General barriers	Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	5	2.9	1.5	4	2.2	1.3
Technical barriers	General barriers	Lack of data and metrics for biodiversity	5	3.1	1.3	3	2.8	0.2
Technical barriers	General barriers	Lack of data and metrics for ecosystem services, ecological processes and functions	5	4.3	0.5	3	3.7	0.5
Technical barriers	General barriers	Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)	5	4.5	0.4	3	3.8	0.5
Governance barriers	General barriers	Lack of convergence in stakeholders' interests	5	3.9	0.8	3	4.2	0.9
Governance barriers	General barriers	Lack of laws and policies engaging conservation, management and restoration of natural environments	5	2.8	1.6	3	2.9	0.1
Governance barriers	General barriers	Limitations in coordinated decision making	5	3.4	1.1	2	3.6	1.1
Technical barriers	General barriers	Mismatch between socioeconomic needs and restoration works (e.g., interventions overlapping with bathing season)	4	3.0	0.7	4	3.1	0.6
Financial barriers	General barriers	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	4	4.2	0.2	4	3.9	0.1
Financial barriers	General barriers	Low SHORT-TERM returns from investments	4	3.9	0.1	4	3.4	0.4
Financial barriers	General barriers	Short term and small-scale bias	4	3.8	0.2	4	3.9	0.1
Financial barriers	Proposed barriers	Difficulty in defining the benefits for the stakeholders	4	-	-	4	-	-
Financial barriers	Proposed barriers	Difficulty obtaining budgets for long-term maintenance	4	-	-	4	-	-
Governance barriers	General barriers	Negative social perception and pervasive inertia (i.e., passive attitude of institutions and other stakeholders)	3	3.4	0.3	3	3.4	0.3
Governance barriers	General barriers	Bureaucratic issues or delays in authorising the work or receiving work permits	3	3.7	0.5	3	3.4	0.3

Governance barriers	General barriers	Lack of social engagement in restoration activities	3	3.3	0.2	2	3.3	0.9
Financial barriers	General barriers	Lack of economic resources to invest in restoration actions	2	3.6	1.1	3	3.4	0.3
Governance barriers	General barriers	Focus in short term policies	2	3.3	0.9	2	3.4	1.0
Technical barriers	General barriers	Delayed performance of restoration projects	2	2.6	0.4	1	2.6	1.1
Technical barriers	General barriers	Limited engineering and ecological expertise (e.g., current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	1	2.8	1.3	1	3.1	1.5
Technical barriers	General barriers	Difficulties with monitoring programs (e.g., scarce accessibility to wetlands, islands, etc.)	1	3.1	1.5	1	3.0	1.4
Technical barriers	General barriers	Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)	1	2.6	1.1	1	1.9	0.6
Technical barriers	Further barriers	Insufficient restoration pace/scale with uncertain benefits and trade-offs	1	3.1	1.5	1	3.6	1.8
Financial barriers	General barriers	Business plans bound to local constraints	1	3.2	1.6	1	2.9	1.3
Technical barriers	Further barriers	Acute degradation level and divergence in target state	1	3.4	1.7		3.6	

Focusing on technical barriers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of barriers according to these parameters to detect the barriers which are more important to address in the Nahal Dalia pilot site (Figure 51). In the upper right quadrant, the technical barriers with the highest score were collected, which had the greatest relevance for the Pilot and occur more frequently, which should be the priority technical barriers to address by the Pilot and the CORE-PLAT. Thus, the "**difficulties related to management plans", "shared definition of the image a success common to all stakeholders**", "**poor sequencing and limited compatibility with existing infrastructure**", and the **"long term ownership of the land**" were the barriers identified as most relevant and frequent, followed by highly frequent but less relevant "lack of physical room for restoration", and then by the "mismatch between socioeconomic needs and restoration". Thus, the previously mentioned important barriers (the ones that score the highest both on relevance and frequency) should be addressed and reinforced in the Nahal Dalia CORE-PLAT to facilitate coastal restoration.

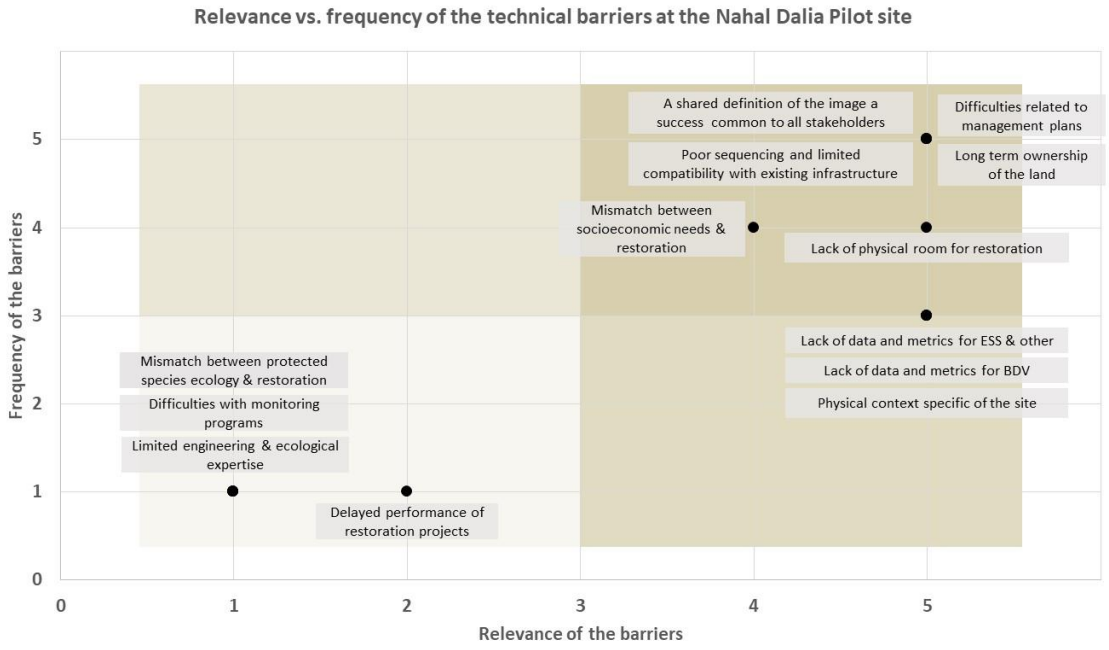

Figure 51. Relevance and frequency of the technical barriers at the Nahal Dalia pilot site. The frequency of the barriers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.
In this section, the connections between the technical barriers of the Nahal Dalia pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new barriers proposed by the Pilot. Firstly, for each of technical barriers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two barriers, the score was 0. Secondly, the scores of each type of connection (strong and weak) for each of the governance and financial barriers were added and a summary of the total strong and weak connections of each of the technical barriers with each group of barriers (governance and financial) was compiled (see Table 50). Thus, the "**lack of data and metrics for ecosystem services, ecological processes and functions**" was considered the technical barrier that scored highest in terms of connections to governance and financial barriers, followed closely by the "**difficulties related to management plans**", and a "**shared definition of the image a success common to all stakeholders"**.

Table 50
A summary of the total connections (strong and weak) between each of the technical barriers and governance and financial barriers in the Nahal Dalia pilot site.

		Nahal Dalia Pilot														
		TECHNICAL BARRIERS														
		General barriers										Further barriers			Proposed barriers	
	Type of connections between technical BARRIERS and any governance or financial BARRIERS	Limited **engineering and ecological expertise** (e.g. current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	Lack of data and metrics for BDV	**Lack of data and metrics for ecosystem services, ecological processes and functions**	**Difficulties with monitoring** programs (e.g., scarce accessibility to wetlands, islands, etc.)	**Difficulties related to management plans (e.g. plans still to be defined, lack of consensus)**	Delayed **performance of restoration** projects	Lack of **physical room for restoration** (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure /activities)	Mismatch between **protected species ecology** and restoration works (e.g., interventions overlapping with bird nesting season)	Mismatch between **socioeconomic needs and restoration** works (e.g., interventions overlapping with bathing season)	Physical context specific of the site (e.g., terrain **typology,** watershed, hydrological context, sand availability.	Acute degradation level and **divergence in target state**	Insufficient **restoration pace/scale with uncertain benefits** and trade-offs	Poor **sequencing** and limited compatibility with **existing infrastructure**	**A shared definition of the image a success common to all stakeholders**	Longterm **ownership of the land** (A lease from the government for a specific purpose)
Governance barriers	**STRONG connections**	6	2	12	8	16	10	12	2	12	0	10	12	8	10	6
	WEAK connections	7	9	4	6	2	5	4	9	4	10	5	4	6	5	7
Financial barriers	**STRONG connections**	0	2	12	4	6	2	2	2	0	0	0	8	0	12	4
	WEAK connections	9	8	3	7	6	8	8	8	9	9	9	5	9	3	7
	Score of STRONG connections between barriers	6	4	24	12	22	12	14	4	12	0	10	20	8	22	10
	Score of WEAK connections between barriers	16	17	7	13	8	13	12	17	13	19	14	9	15	8	14
	Total score of connections between barriers	**22**	**21**	**31**	**25**	**30**	**25**	**26**	**21**	**25**	**19**	**24**	**29**	**23**	**30**	**24**

7.2.9.4 Enablers to coastal restoration upscaling

As in the analysis of the barriers for coastal restoration, the section below aims to represent the results of the enablers analysed in the Nahal Dalia in three main dimensions as well. The first part shows the results of a qualitative analysis, concerning the convergence between the SHs and Pilot perspectives in identifying **a total of 13 enablers proposed in the forms sent to both groups**. Secondly, there is the representation of the results

from the quantitative analysis in which the enablers have been prioritized according to the relevance and the frequency determined by the Nahal Dalia Pilot. Finally, there is an analysis of the connections between the technical barriers with the financial and governance ones.

Coincidences in the perspectives of the Pilot and the SHs: a qualitative analysis

This section provides insightful information on the degree of coincidence of the enablers identified in the Nahal Dalia site, by integrating the SHs perceptions with the Pilot analysis (see Table 51):

- The Pilot and the SHs coincided in 13 of the enablers, which means full coincidence (100%). To have an aligned view on enablers could be a relevant factor to boost the practice of restoration in the area.
- The enablers in which the most concurrence was shown gathered 75% (or more) of the SHs attention.
- In addition, 62% (n=8) of the identified enablers are highly coincidence. It means the conjunction of the Pilot with at least 50% of the SHs.
- However, in 38% (n=5) of the enablers, the Pilot coincided with less than 50% with the SHs.

Table 51

Identified and unidentified enablers by the Pilot and SHs in the Nahal Dalia pilot site. The identified enablers are marked in light blue and unidentified ones are in white. The coincidence between the Pilot and SHs is indicated by 1 (light blue) while the high coincidence is indicated by 2 (dark blue). Number 0 means no coincidence enablers. The percentage of the SHs that identified each enabler is indicated in the table.

		Identified/unidentified enablers							
		Pilot perspective	Stakeholders' perspective						Pilot + SHs perspective
		Nahal Pilot level	Nahal SH1: Government and public admin.	Nahal SH2: Local companies and professional committees	Nahal SH3: Government and public admin.	Nahal SH4: Research and education	Nahal SH5: Research and education	Nahal SHs (%)	Nahal Pilot + SHs coincidence
TECHNICAL ENABLERS	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)							20%	1
	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)							60%	2
	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)							20%	1
	Proactive maintenance with performance indicators							80%	2
	Willingness to promote restoration among stakeholders							80%	2
GOVERNANCE ENABLERS	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)							40%	1
	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)							40%	1
	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)							20%	1
	New plans for transition in governance (promoting participation and sharing the benefits)							100%	2
	Continued training for deeper stakeholder involvement							60%	2
FINANCIAL ENABLERS	Increasing restoration funding							80%	2
	Innovative value-capture instruments and business models							60%	2
	Improved capacity to develop business models and bankable plans							80%	2

Highest coincidence

- The highest coincidence was on the governance enabler of "new plans for transition in governance (promoting participation and sharing the benefits)", which was identified by 100% of the SHs from all sectors in agreement with the Pilot.
- Other of the highest coincidences are the technical enablers "advanced forecasting models that support connectivity restoration", "proactive maintenance with performance indicators", as well as the financial enablers "increasing restoration funding, and "Improved capacity to develop business models and bankable plans" have gathered an 80% of the SH's attention.

Proposed enablers

The proposed enablers are those remarked by the Pilot, which could not be classified into the established categories of the Excel form. Those are:

Technical

- "Management and maintenance processes are lacking. There are budgets for construction, not operation and maintenance".
- "It is necessary, as stated, to state the desired rehabilitation actions and to hear the discussions of the positions of the stakeholders regarding them".
- "Models can help, only subject to concrete guidelines".
- "There is a plan for managing the overlap in the council".
- "Master Plan for the ICZM Coastal Area (Moshe Lenner)".
- "High awareness and mobilization of local bodies and residents to protect the coastal environment".
- "Planning and consent are a prerequisite for any planning of a rehabilitation operation".
- "Mapping needs and then solving the "how".

Financial

- "Development of a business model – at the stage of operation and maintenance".
- "All of the above moves complement each other. Increasing funding sources is important for long-term maintenance, for preserving rehabilitation".
- "Innovative models and tools are important for assessing economic feasibility, as an incentive for stakeholders, some of whom are business entities, for whom profit and return on investment are important".

Relevance and frequency of the enablers for coastal restoration upscaling: a quantitative analysis

In this section, the information shows quantitative differences between the prioritization of the enablers in the Nahal Dalia Pilot. As a prioritization criterion, relevance gained importance over frequency, considering this last variable as a function of the previous one.

Relevance of the enablers

The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 13 enablers were diagnosed and valued, including technical but also financial and governance ones.
- A total of 10 enablers (77%) of those diagnosed enablers were highly relevant (valued between 4 and 5) while 3 enablers (23%) were less relevant (between 1 and 3).

- From the highly relevant enablers, 40% were technical, 30% were governance and 30% were financial (Figure 52).

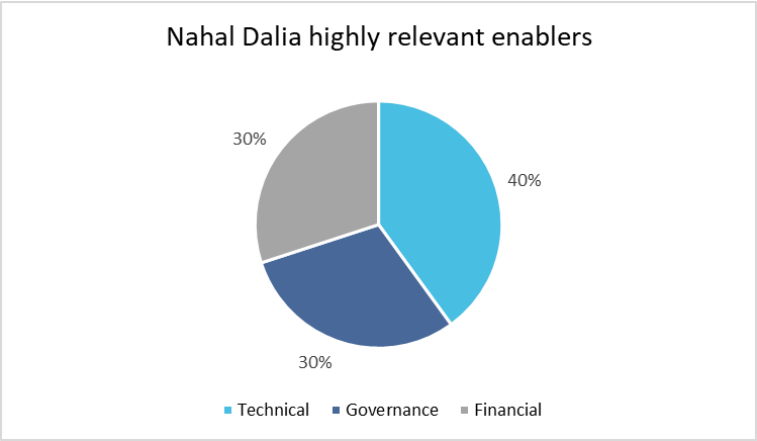

Figure 52. Highly relevant technical, governance and financial enablers in the Nahal Dalia pilot site.

Frequency of the enablers

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent".

From those highly relevant enablers (a total of 10 highly relevant enablers), 80% (n=8) were diagnosed as highly frequent, facilitating the development of restoration in the Nahal Dalia Pilot. Those are the most relevant and frequent:

- "Willingness to promote restoration among stakeholders".
- "New plans for transition in governance (promoting participation and sharing the benefits)".
- "Continued training for deeper stakeholder involvement".
- "Increasing restoration funding".
- "Innovative value-capture instruments and business models".
- "Improved capacity to develop business models and bankable plans".
- "Proactive maintenance with performance indicators".
- "Explicit accounting of coastal natural capital (biodiversity and ecosystem services)".
- "Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)".
- "Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)".

Relevance and frequency of the enablers

Considering the most relevant and frequent enablers in the Nahal Dalia Pilot (scored with a value of 5 in relevance and frequency), the highest priority belong to the technical enabler "**willingness to promote restoration among stakeholders**", while at the governance level is the "**new plans for transition in governance**", as well as the "**continued training for deeper stakeholder involvement**", and at the financial level is the "increasing restoration funding", as well as two other high-scoring financial enablers (see Table 52).

The following table (Table 52) contains the list of all the enablers identified by the Nahal Dalia Pilot. They were arranged from along the degree of relevance as well as how frequent the Pilot must deal with them. In

addition, the relevance and frequency scores of the Nahal Dalia Pilot were compared with the REST-COAST average of each of the enablers to integrate the present Pilot within the global analysis of the 9 Pilots of the REST-COAST project. Considering the previous enablers above (scored with a value of 5 in relevance and frequency), the "new plans for transition in governance (promoting participation and sharing the benefits)" and the "improved capacity to develop business models and bankable plans" were further from the REST-COAST average for relevance (SD 1.6 and 1.7, respectively), and frequency (SD 1.6 and 1.6, respectively) than the other enablers. On the contrary, this Pilot's score for the "willingness to promote restoration among stakeholders" is the closest to the REST-COAST average (with a SD value of 0.8 for relevance, and 1.0 for frequency). It is also worth to highlight higher deviations for other enablers in this Pilot that are less aligned with the REST-COAST global trends, as "**New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)**", as scored as little relevant, but it is far from the global REST-COAST (SD 1.7).

Table 52

Ranking of the total enablers for coastal restoration upscaling identified by the Nahal Dalia Pilot, including technical, governance and financial ones. The total enablers are ordered according to their importance in the pilot site, first by their relevance according to the Pilot (from highest to lowest relevance) and then, by the frequency with which they occur (from highest to lowest frequency). The table includes the REST-COAST average of the relevance and frequency of each of the enablers considering the data from the 9 pilot sites of the project as well as the standard deviation of the Nahal Dalia Pilot's score from the REST-COAST average.

Enabler type 1	Enabler type 2	Enabler	RELEVANCE of this ENABLER at the Nahal Dalia pilot site	RELEVANCE of this ENABLER at pilot sites (REST-COAST average)	SD RELEVANCE REST-COAST	FREQUENCY of this ENABLER across restauration actions at the Nahal Dalia pilot site	FREQUENCY of this ENABLER at pilot sites (REST-COAST average)	SD FREQUENCY REST-COAST
Technical enablers	General enablers	Willingness to promote restoration among stakeholders	5	3.9	0.8	5	3.8	0.9
Governance enablers	General enablers	New plans for transition in governance (promoting participation and sharing the benefits)	5	2.7	1.6	5	2.8	1.6
Governance enablers	General enablers	Continued training for deeper stakeholder involvement	5	3.2	1.3	5	2.3	1.9
Financial enablers	General enablers	Increasing restoration funding	5	3.4	1.1	5	2.6	1.7
Financial enablers	General enablers	Innovative value-capture instruments and business models	5	3.2	1.3	5	2.9	1.5
Financial enablers	General enablers	Improved capacity to develop business models and bankable plans	5	2.6	1.7	5	2.7	1.6
Technical enablers	General enablers	Proactive maintenance with performance indicators	5	3.2	1.3	4	2.4	1.1
Governance enablers	General enablers	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	5	3.2	1.3	3	2.3	0.5
Technical enablers	General enablers	Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)	4	2.9	0.8	4	2.6	1.0
Technical enablers	General enablers	Advanced forecasting models that support connectivity restoration (e.g., sediment transport modelling)	4	4.0	0.0	2	3.4	1.0
Technical enablers	General enablers	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	3	2.8	0.2	3	2.2	0.5
Governance enablers	General enablers	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	3	3.3	0.2	3	3.1	0.1
Governance enablers	General enablers	New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)	1	3.4	1.7	1	2.7	1.2

Focusing on technical enablers, they were represented according to their relevance and frequency by a scatter graph where the frequency is a function of relevance to have the distribution of enablers according to these parameters to detect the enablers which are priority to become an opportunity to promote coastal restoration upscaling in the Nahal Dalia pilot site (Figure 53). In the upper right quadrant, the technical enablers with the highest score were collected. The technical enabler "**willingness to promote restoration among stakeholders**" had the greatest relevance and frequency, which should be addressed in the Nahal Dalia CORE-PLAT, together with those enablers proposed by the SHs, to generate opportunities to facilitate coastal restoration. The following most relevant technical enablers, but which occur less frequently than the previous one, is the

"proactive maintenance with performance indicators", and this was followed by a lower grade of frequency and relevance by the "implementation and planning within a safe operating space".

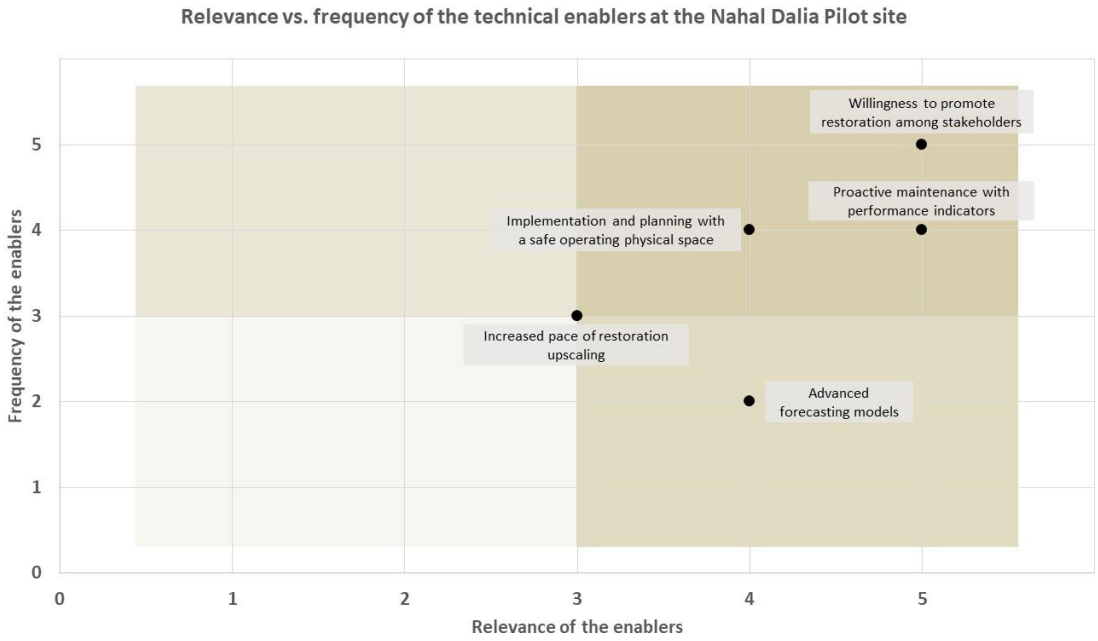

Figure 53. Relevance and frequency of the technical enablers at the Nahal Dalia pilot site. The frequency of the enablers is a function of the relevance.

Connections between technical and financial and governance barriers: a quantitative analysis.

In this section, the connections between the technical enablers of the Nahal Dalia pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. Firstly, for each of technical enablers identified by the Pilot, the connections with the governance and financial barriers were determined and "weak connections" were scored with 1 (occasional connection) and "strong connections" with 2 (frequent connection). In case of no connection between two enablers, the score was 0. Secondly, a summary of the total strong and weak connections of each of the technical enabler with each group of enablers (governance and financial) was compiled (see Table 53). The "**willingness to promote restoration among stakeholders**" was considered the technical enabler with the highest scores of connections to governance and financial enablers, followed closely by "**implementation and planning with a safe operating physical space** (i.e., safety from flooding, erosion, etc.)". Therefore, as these are being amplified by other type of enablers, they could bring a good opportunity to promote and facilitate the coastal restoration upscaling.

Table 53
A summary of the total connections (strong and weak) between each of the technical enablers of the Nahal Dalia pilot site and governance and financial enablers.

		Nahal Dalia Pilot				
		TECHNICAL ENABLERS				
		General enablers				
	Type of connections between technical ENABLERS and any governance or financial ENABLERS	Advanced **forecasting models** that support connectivity restoration (e.g., sediment transport modelling)	**Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)**	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	Proactive maintenance with performance indicators	**Willingness to promote restoration among stakeholders**
Governance enablers	STRONG connections	4	6	4	4	6
	WEAK connections	3	2	3	3	2
Financial enablers	STRONG connections	0	2	0	2	4
	WEAK connections	3	2	3	2	1
	Score of STRONG connections between enablers	4	8	4	6	10
	Score of WEAK connections between enablers	6	4	6	5	3
	Total score of connections between enablers	**10**	**12**	**10**	**11**	**13**

7.2.9.5 Closing remarks

- **Governance was seen by all SHs as the main barrier category to coastal restoration in the Nahal Dalia Pilot, while the main potential enabler category was governance as well**. The Pilot highlighted the complexity in creating economic value for the SHs in an area undergoing ecological restoration.
- At the Nahal Dalia pilot site, there was a **high level of agreement between the perspectives of the Pilot and the SHs regarding the identified barriers and enablers to restoration**. Regarding the barriers, the coincidences between the perspectives of the Pilot and SHs were distributed among the different types of the barriers. However, the highest coincidence between the two groups was in the governance enabler "**new plans for transition in governance (promoting participation and sharing the benefits)**", which was detected by the Pilot and 100% of the SHs. Also, the financial enablers category had the greater coincidences between the perspectives of both groups.
- **Most of the highly relevant barriers were technical (41%)**, in contrast to financial (32%) and governance (27%) barriers. In addition, **among the highly relevant barriers, 73% were diagnosed as highly frequent**, always appearing while developing restoration in the Nahal Dalia Pilot.
- **Considering the most relevant and frequent barriers in the Nahal Dalia Pilot, almost half of these (45%) were technical barriers**. The barriers identified as most relevant and frequent by this Pilot were the following: "**difficulties related to management plans**", which was also detected by 80% of the SHs and it had one of the highest score of connections to other barriers; "**a shared definition of the image a success common to all stakeholders**" (it also had one of the highest score of connections to other barriers); "poor sequencing and limited compatibility with existing infrastructure", and the "long term ownership of the land". The "**lack of data and metrics for ecosystem services, ecological processes and functions**", which was highly relevant but less frequent from the Pilot's perspective, was the highest scoring technical barrier in terms of connections to governance and financial barriers.

- **The most relevant and frequent governance barriers in this Pilot** were the "lack of integrated approach" (detected by the 60% of the SHs), "dealing with socioeconomic needs" and "the implication of changing the land use definition". **The most relevant and frequent financial barriers were** the "lack of long-term economic support" and "lack of knowledge, experience and regulation support carbon fixation".
- **Most of the highly relevant enablers were technical (40%)**, followed by 30% governance and 30% financial. **Among those highly relevant enablers, 80% were diagnosed as highly frequent**, facilitating the development of restoration in the Nahal Dalia Pilot. The technical enabler "**willingness to promote restoration among stakeholders**" had the highest relevance and frequency for the Pilot and obtained the highest score of connections with governance and financial enablers, these results being consistent with the SHs' perspective, since that was detected by 80% of the SHs. "**Implementation and planning with a safe operating physical space**" was the other enabler that obtained the highest score in connections with other types of enablers and was detected by 60% of the SHs.
- At the governance and financial level, this pilot site has some relevant and frequent enablers that should be strengthened to facilitate coastal restoration. Also, it is worth noting the governance enabler "**new policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)**", which was scored as not very relevant, unlike other REST-COAST Pilots. Reinforcing this enabler with the experiences of other Pilots (in which it is a more relevant and frequent enabler) could be a valuable opportunity to facilitate coastal restoration in this pilot site.

7.3 Overall results in the REST-COAST project and discussion

7.3.1 Key stakeholders' perspectives on barriers and enablers

This section explores the results of the form sent to local key SHs of each Pilot (CORE-PLAT). **From a global REST-COAST perspective, a total of 55[20] stakeholder organisations answered the form**. This is considered **a very good participation result, which brought genuine and large-scale insights** into the factors that can block or facilitate the practice of coastal restoration. The types of SHs responding to the form were diverse (Figure 54). **Public sector organizations predominated (38% of responses)**, including different levels of government, from the most local to the regional or national level. It is worth to highlight the relevance of the participation of public authorities in the discussion around barriers and enablers for the future of coastal restoration upscaling since many of them have competencies or are directly involved in planning and management activities in the Pilot areas. Therefore, bringing them on board at an early stage of the REST-COAST project is also remarkable. **Third sector organisations (NGOs) and Research and education entities were also widely represented in our sample, with a range from 24% to 31%, respectively**. Within this groups there is also heterogeneity in the characteristics of the organisations that joined these exercises. On the one hand, both environmental organisations and research and education organisations, might be locally involved in projects related to nature conservation that have to do with ecosystem management, dissemination, and public participation. On the other hand, they are interesting players due to its background in the practice of coastal restoration. This can be an advantage to put the focus in the most relevant issues, not only environmental but also social, that may constraint future actions. Consequently, the interaction within the project and the CORE-PLATS arises as a good opportunity to discuss with public authorities, researchers, and activists, among others, at a high technical level, also disseminating the concepts that are on the core of the REST-COAST project itself (as NBS, ESS, soft vs hard engineering, climate change adaptation, forecasting, co-creation and many more). **Finally, Local companies and professional committees were also part of the form as a small proportion of the total participation (7%)**. However, it is worthwhile, as some of these committees represent the interests of a sector or bring together several smaller organisations.

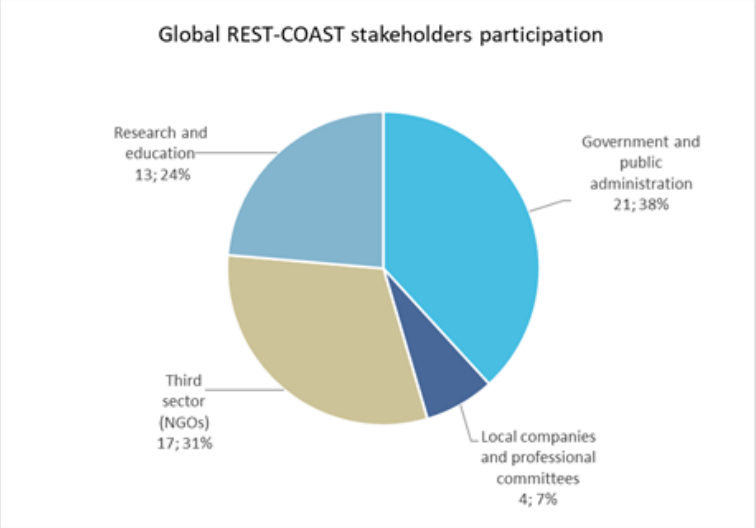

Figure 54. Global stakeholders' participation in the form for the analysis on barriers and enablers conducted in the 9 pilot cases of the REST-COAST project (n=55).

At the current stage the project, it was considered essential to explore how comfortable SHs feel to discuss about barriers and enablers in their respective case-study restoration platforms (CORE-PLATs). Thus, a specific

[20] This figure includes the participation in the 9 pilot cases of the project.

question was included in the form with a range of answers going from 1 ("Not so much...and this hinders the flow of information") to 5 ("Very much...I feel the CORE-PLAT is an open forum to discuss about concerns and ideas around coastal restoration"). **The average result obtained (3.8) shows a very good environment for discussion in the CORE-PLATS** with some small differences among Pilots (SD 1.1).

Before going into detail in the analysis, a preliminary question was posed to capture the impressions of the SHs on the main barriers categories (Figure 55). **Governance appeared indisputably as the top perceived barrier category (74% of answers) in the overall REST-COAST project**, followed far behind by financial barriers (17%). On the contrary, technical barriers (7%) were seen as a minor concern when blocking the coastal restoration practice.

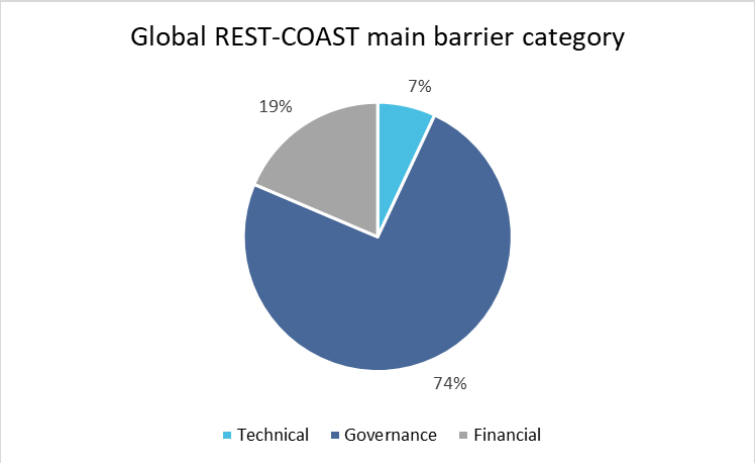

Figure 55. Global stakeholders' perception on the main barrier category, summing up the results obtained in the 9 pilot cases of the REST-COAST project.

Another factor to consider was whether **SHs felt that barriers have been a relevant factor that has hampered coastal restoration efforts in the past in their pilot areas or not**. The range of potential SHs' answers went from 1 ("No, I don't feel barriers might have had a relevant role in the past") to 5 ("Yes, I feel we have seen restoration being hampered by barriers in the past"). There was a broad consensus around this statement with an **average result of 4.0** and some small differences among Pilots (SD 0.9).

Accordingly, **governance was also perceived by almost half of the SHs (54%) as the main category of enabler** (Figure 56). Unlike what was observed for the barriers, the weight of financial (28%) and technical (18%) enablers was higher. Additionally, REST-COAST SHs perceived enablers as a lower relevant factor (3.3 and SD 1.1) than barriers, when considering its potential to boost past coastal restoration efforts. Again, the range of potential SHs' answers went from 1 ("No, I don't feel any enabler might have had a relevant role in the past") to 5 ("Yes, I feel we have seen restoration being unblocked by some enablers in the past").

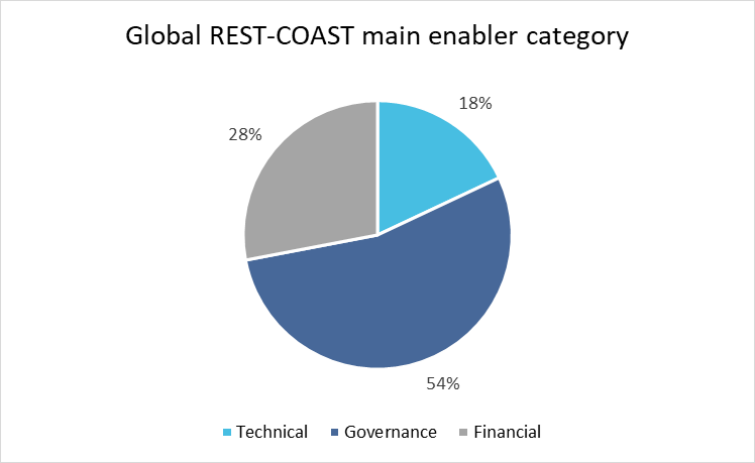

Figure 56. Global stakeholders' perception on the main enabler category, summing up the results obtained in the 9 pilot cases of the REST-COAST project.

In any case, SHs' perceptions point to governance as the keystone of coastal restoration in the REST-COAST pilot areas. However, **this result is aligned with the project framework**, which is based on a combination of technical, financial and management innovations that can support a shift in governance and perception to enhance social engagement to restoration (Sánchez-Arcilla *et al.* 2022).

7.3.2 Barriers to coastal restoration upscaling

This section shows the overall barriers analysis in the REST-COAST project in the three dimensions explored. The first part compiles the global list of the barriers identified in this analysis, that is, those were proposed by the Pilots and SHs of each of the Pilot cases of the project, which expand the conceptual framework that was the basis of D1.2. (Sánchez-Arcilla *et al*. 2022). Secondly, results of the quantitative analysis are presented, in which the barriers were prioritized according to the relevance and the frequency determined by concerning the convergence between the SHs and Pilot perspectives for the overall project consortium. Finally, in the last part of the present section, the graphical representation of relevance and frequency of technical, governance and financial barriers is analysed at a global project scale.

7.3.2.1 Global list of barriers in the REST-COAST project

As a complement to the barriers present in the paper from Sánchez-Arcilla *et al*. 2022, the SHs group and Pilot scientific teams of the nine pilot sites of the project also had the opportunity to introduce new aspects that hamper coastal restoration. An aggregated version[21] of the proposed barriers is presented here (Table 54). This initial version of the proposed barriers includes some heterogeneity, covering not only genuine barriers that may respond to local particularities but also slight differences with barriers that are also present in the paper. A next step would be necessary to process this information and being able to distinguish relevant local singularities from redundancies. To do so, a further iteration to discuss it within the local CORE-PLATS is recommended.

[21] A detailed analysis of the proposed barriers can be found in the Specific results per Pilot section.

Table 54

Proposed technical, governance and financial barriers gathered in the different Pilots. For each Pilot, barriers proposed by the scientific and technical team of the Pilot are distinguished from the ones suggested by key local SHs.

		Barriers		
		Technical	**Financial**	**Governance**
Wadden Sea Pilot	**Pilot**	1. Limited COMBINED knowledge of engineering and ecology/biology.		1. Available man-power at administrative level (technical and governance).
	SHs		1. Renaturation should reduce costs in the long term. 2. Search for a balance between social and private benefits versus costs.	1. When things get tense, some (functionally minded) partners tend to stick to only their own task(s). 2. Finding solutions is highly complex. The requirements of stakeholders vary widely. There are no easy solutions.
Ebro Delta Pilot	**Pilot**		1. Lack of budget for long-term restoration project's assessment.	1. Feeling of grievance in the territory for opportunities lost in the past and that conditions future actions.
	SHs	1. Lack of pilot actions to know which are most appropriate and effective	1. Most resources are there, but depend on the state, which does not have a defined or consensus roadmap. 2. Lack of decision and political vision in the middle and long term.	1. It would be a priority to define consensus between governments and actors and to act within these areas of consensus; it has been too long ago no progress because of political tactics and lack of agreements. 2. Lack of clear policies and priorities in the middle/long term.
Venice Lagoon Pilot	**Pilot**			
	SHs	1. Difficulties in governance due to the presence of many entities	1. Lobby of economic activities, community and regional administrations little attention. 2. Resources wasted and not used correctly (greenwashing).	1. Excess of stakeholders making governance difficult and ad hoc and uncoordinated specific projects. 2. I believe that a barrier is also the lack of knowledge of the territories on the part of political decision-makers.
Vistula Lagoon Pilot	**Pilot**	1. General long term economic degradation of Vistula Lagoon.	1. Economic backwardness generates a need for outside financing.	1. Governance barriers reflect general economic backwardness of the region.
	SHs	1. Restoration of biodiversity in our case depends on the course of the sediment consolidation process on the island so that succession can enter and the ground stabilizes enough to become stable enough for nesting by birds.	1. The artificial island was created as a side effect of the investment project Construction of a waterway between the Gulf of Gdańsk and the Vistula Lagoon. After the completion of the project, financial outlays will be necessary for the pro-nature development of the island, stimulating succession, mowing or other activities, but these activities will no longer be financed from investment funds, hence possible limitations in the availability of funds. Earlier difficulties were related to limited funds for the development of a draft protection plan for Natura 2000 sites in the Vistula Lagoon and its surroundings. The implementation of these plans also entails significant expenses for the implementation of protective tasks.	1. The long-term process of approving protection plans for Natura 2000 sites was and is a limitation. In the case study, however, all activities, ownership rights and responsibility for the island rest with the Maritime Office in Gdynia, and any restrictions will depend on the effectiveness of cooperation with nature protection authorities, taking into account that the director of the maritime office is the supervisor of marine areas of the Natura 2000 network.
Foros Bay Pilot	**Pilot**			
	SHs	1. Poor awareness among the general public and some business organizations	1. Restrictions on applying for projects, lack of a national policy for state co-financing, inconsistency in prioritization in planning/strategic documents with the real need for conservation.	1. Lack of coordination of the actions of the various departments
Rhone Delta Pilot	**Pilot**			
	SHs	1. Waste of time convincing local users.		1. For the moment, the financial resources on the Pilote site in the Delta du Rhône are mainly linked to projects, and do not make it possible to hire people in the long term on substantive missions and who require to be able to project themselves further than the schedule of a project. It would be necessary to have guaranteed long-term funding not specifically dedicated to specific projects to be able to hire such people.
Sicily Pilot	**Pilot**			
	SHs	1. Insensitivity to issues. 2. Lack of experimental experiences in restoring biotic conditions.		

Arcachon Bay Pilot	**Pilot**	1. High spatial variation in local contexts (flow velocities and directions, waves heights, sediment types, …).	1. Ecological restoration mostly relying on regional / national grants to local MPA, that do not rely on ROI to fund additional actions, and has no resources to get these additional fundings. 2. Stakeholders that might have the budget to support large scale restoration actions for ESS production are not decision-making on the strategy for ecosystem management in the area.	1. Dissociation of the governance units dealing with biodiversity and the ones dealing with issues that could be solved (at least partially) through ecosystem services provided by local ecosystems.
	SHs			
Nahal Dalia Pilot	**Pilot**	1. A shared definition of the image a success common to all stakeholders. 2. Longterm ownership of the land (A lease from the government for a specific purpose).	1. Difficulty in defining the benefits for the stakeholders. 2. Difficulty obtaining budgets for long-term maintenance. 3. Lack of knowledge, experiencei and regulation support Carbon fixation.	1. The implication of Changing the land use definition (from agriculture to other) on ownership and rights of the stakeholders on the territory.
	SHs	1. Possession of the ground. 2. Difficulty defining the picture of success – under-response to all the needs of the relevant stakeholders. 3. Possession of the ground, difficulty in defining what the picture of success is – under-response to all the needs of the relevant stakeholders. We have embarked on the project, and the conversation has not yet been built, there are no agreements yet. 4. There is good experience in reaching broad agreements in the area (a policy document for PV roofing in fish ponds and water reservoirs, adopted by a district committee, done in cooperation with many entities in the region). Statutory limitations – the coastal strip on the one hand is very sensitive, on the other hand there is a lot of infrastructure. 5. Having multiple stakeholders in a relatively small space makes it difficult to agree. 6. Rehabilitation actions are sometimes contrary to the needs of stakeholders. 7. Data on biodiversity and system services is currently lacking.	1. Lack of specific economic resources in the drainage authority (ability to support projects), difficulty in defining the benefit. 2. After the restoration activities, the rehabilitated site must be maintained, especially if the site is open to visitors - crowd management includes waste disposal and regular maintenance. 3. The current budget focuses only on reconstruction activities.	1. Public- It has not been defined who the public is. 2. Bureaucracy – issues of property vis-à-vis the ILA, security activity in open spaces. 3. A sustainable project must include environmental, economic and social components. 4. Public involvement and support is essential for the success of rehabilitation in the short and long term. 5. It is important not to ignore the needs of the public. 6. A planned user survey will address this barrier.

7.3.2.2 Barriers: A quantitative analysis of its relevance and frequency

In this section the quantitative differences are shown between the priority barriers in REST-COAST project. Same as the criterion adopted in the Pilot analysis, relevance gained importance over frequency, considering this last variable as a function of the previous one. The value of the relevance of the barriers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the barriers scored between 4 and 5 were considered “highly relevant barriers” while barriers between 1 and 3 were considered “less relevant barriers”.

1. A total of 28 barriers were identified and valued in the overall REST-COAST project, including technical but also financial and governance ones.
2. A total of 7 (25%) of the diagnosed barriers were highly relevant (valued between 4 and 5) while 21 (75%) were less relevant (between 1-3).
3. Going in deep to the highly relevant barriers detected the overall REST-COAST project, nearly most were technical (43%), with 29% governance and 29% financial barriers (Figure 57).

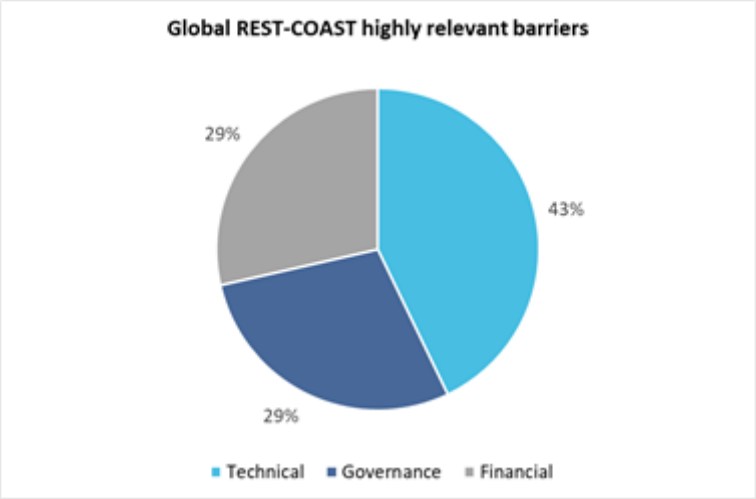

Figure 57. Highly relevant technical, governance and financial barriers in the overall REST-COAST project, summing up the results obtained in the 9 pilot cases.

However, it is worth considering that at the overall REST-COAST project scale some other barriers scored on average close to the relevance threshold, set in almost 4 over 5. Thus, 5 barriers had relevance values higher than 3.5. Accordingly, the number of relevant barriers will be 12.

The value of the frequency of the barriers was between 1 (Pilots in the REST-COAST project never have to deal with this barrier) and 5 (Pilots always must deal with this barrier). In the analysis, barriers scored between 4 and 5 were considered "highly frequent" while the barriers scored between 1 and 3 were considered "less frequent". **Among those highly relevant barriers (a total of 7 highly relevant barriers), 42% (n=3) were diagnosed as highly frequent, always appearing while developing restoration in the Pilot sites**. However, if the range for "frequent" barriers is expanded to those that scored higher than 3.5 (as done for the relevance), 75% (n=9) of the "relevant" barriers (a total of 12 relevant barriers) can also be considered "frequent". The identification of this combination of relevance and frequency in three-quarters of the restoration barriers may have relevant implications for the future of restoration activities, not only in the project pilot cases but also in a broad sense. The following are the relevant and frequent barriers at REST-COAST scale, where the highly relevant ones (average relevance ≥ 4) are in bold:

- **Lack of long-term economic support**
- **Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**
- **Lack of data and metrics for ecosystem services, ecological processes, and functions**
- **Dealing with socioeconomic needs**
- **Low benefit-cost ratios (or a lack of cost-benefit evaluation)**
- **Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)**
- **Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)**
- Lack of convergence in stakeholders' interests
- Low SHORT-TERM returns from investments
- Short term and small-scale bias
- Bureaucratic issues or delays in authorizing the work or receiving work permits.
- Lack of economic resources to invest in restoration actions.

This brings an interesting consensus perspective to the analysis of the results at REST-COAST scale as those barriers can be considered major constraints to coastal restoration upscaling in all Pilot sites. Considering the most relevant and frequent barriers in the overall REST-COAST project, the **"lack of long-term economic**

support" was the financial barrier that was most relevant and occurred more frequently in the overall consortium (see Table 55). Additionally, "**Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**", "**Lack of data and metrics for ecosystem services, ecological processes and functions**" and "**Difficulties related to management plans (e.g., plans still to be defined, lack of consensus)**" were the most relevant and frequent technical barriers. From the governance perspective, "**Dealing with socioeconomic needs**" and "**Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)**" were also on the top of the list.

The following table (Table 55) contains the complete list of all the barriers arranged from along the degree of relevance as well as how frequent the Pilots must deal with them. In addition, the relevance and frequency scores of the Pilots were compared with the REST-COAST average of each of the barriers[22]. The table shows that all barriers included in the exercise score at least 2.5 over 5 for relevance. The same is true for frequency, where any barrier scored less than 1.9. Consequently, both observations imply that the conceptual framework based on the work of Sánchez-Arcilla et al. 2022 is aligned with the meaningful topics for practitioners involved in restoration projects in the REST-COAST consortium. Further aspects within this framework were disclosed in a qualitative and quantitative manner in the present analysis.

A relatively low standard deviation in most of the top 6 relevant barriers was observed, with SD values scoring from 0.9 to 1.1. Three top relevant barriers were recurrently found in Pilots' restoration projects: "**Lack of long-term economic support**", "**Lack of data and metrics for ecosystem services, ecological processes and functions**", "**Dealing with socioeconomic needs**" that had frequency SD between 0.8 and 1.0. Focusing on the frequency, other relevant barriers were less frequently reported in the consortium's restoration projects: "**Low benefit-cost ratios (or a lack of cost-benefit evaluation)" SD (1.5), "Physical context specific of the site (e.g. terrain typology, watershed, hydrological context, sand availability...)**" SD (1.4) and "**Lack of integrated approach (i.e. interdisciplinary and coordinated action among stakeholders)**" (SD 1.5) and "**Difficulties related to management plans (e.g. plans still to be defined, lack of consensus)**" (SD 1.3). However, they might be frequent for some pilots (see previous section) and have potential negative effects when they occur (as they are very relevant). It is also worth to highlight higher deviations for other barriers within the REST-COAST global trends, as "**Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)**" (SD 1.6) and "**Low SHORT-TERM returns from investments**" (SD 1.5). Therefore, the technical, governance and financial barriers mentioned above are the barriers which should be established as priority to be addressed in the project consortium.

If we focus on less relevant barriers, on the one hand, some technical aspects related to the practice of coastal restoration were observed that have been overcome in the most of the Pilots, as "**Mismatch between protected species ecology and restoration works (e.g. interventions overlapping with bird nesting season)**", "**Delayed performance of restoration projects"**, **"Limited engineering and ecological expertise (e.g. current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)"**, "**Lack of physical room for restoration (e.g. beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)**" or "**Mismatch between socioeconomic needs and restoration works (e.g. interventions overlapping with bathing season)**", with relevance values between 2.6 and 3.0. Accordingly, these barriers were also within the less frequent, with frequency values ranging from 1.9 to 3.1. On the other hand, some of these barriers also have the highest SD values, meaning its relevance and frequency is not homogeneous within the consortium and some Pilots may still deal with these issues. Additionally, the "**Lack of laws and policies engaging conservation, management and restoration of natural environments**" was perceived as the less relevant governance barrier in the REST-COAST project, which they are good news, probably because of a variety of policies that already have been developed and implemented in many countries to promote nature protection. However, as mentioned before for other technical barriers,

[22] Further details on the specific comparison of Pilots can be found in the previous section of the report.

there was a high relevance deviation (SD 1.5) meaning that for some Pilots the lack of nature protection policies might still be a relevant fact.

Table 55

Ranking of the total barriers for coastal restoration upscaling identified in the REST-COAST project, including technical, governance and financial ones (categories are depicted in purple in barrier type 1). Barriers are ordered according to their relevance, as the average of the 9 Pilots (from highest, depicted in dark green, to lowest relevance, light green). The same color gradient is used to highlight the average frequency of the barriers. The table also shows the data from the 9 Pilots of the project, as well as the standard deviation within the REST-COAST project. The last is depicted with a red gradient, to emphasize higher deviations with dark red.

			RELEVANCE of this BARRIER at pilot sites											FREQUENCY of this BARRIER at pilot sites										
Barrier type 1	**Barrier type 2**	**LIST OF BARRIERS**	Ebro Delta Pilot	Rhone Delta Pilot	Venice Lagoon Pilot	Vistula Lagoon Pilot	Foros Bay Pilot	Sicily Pilot	Nahal Dalia Pilot	Arcachon Bay Pilot	Wadden Sea Pilot	Relevance REST-COAST average	Desvest Relevance REST-COAST	Ebro Delta Pilot	Rhone Delta Pilot	Venice Lagoon Pilot	Vistula Lagoon Pilot	Foros Bay Pilot	Sicily Pilot	Nahal Dalia Pilot	Arcachon Bay Pilot	Wadden Sea Pilot	Frequency REST-COAST average	Desvest Frequency REST-COAST
FINANCIAL	General	Lack of long term economic support	5	5	5	5	5	5	5	4	2	4,6	1,0	5	5	5	5	5	5	5	4	2	4,6	1,0
TECHNICAL	General	Physical context specific of the site (e.g. terrain typology, watershed, hydrological context, sand availability…)		5	5	5	4	2	5	5	5	4,5	1,1		5	5	4	4	1	3	3	5	3,8	1,4
TECHNICAL	General	Lack of data and metrics for ecosystem services, ecological processes and functions	4	3	5	3	5	5	5	5	4	4,3	0,9	3	4	3	3	5	5	3	4	3	3,7	0,9
GOVERNANCE	General	Dealing with socioeconomic needs	2	5	4	4	5	4	5	5	4	4,2	1,0	5	5	4	4	5	4	5	3	3	4,2	0,8
FINANCIAL	General	Low benefit-cost ratios (or a lack of cost-benefit evaluation)	5	5	4	5	5	4	4	4	2	4,2	1,0	1	5	4	4	5	5	4	5	2	3,9	1,5
TECHNICAL	General	Difficulties related to management plans (e.g. plans still to be defined, lack of consensus)	5	3	5	3	5	2	5	4	4	4,0	1,1	5	5	5	2	5	3	5	2	4	4,0	1,3
GOVERNANCE	General	Lack of integrated approach (i.e. interdisciplinary and coordinated action among stakeholders)	5	3	5	1	5	5	5	5	2	4,0	1,6	5	5	3	1	5	5	5	4	2	3,9	1,5
GOVERNANCE	General	Lack of convergence in stakeholders' interests	4	4	4	3	5	4	5	4	2	3,9	0,9	5	5	5	3	5	4	3	4	4	4,2	0,8
FINANCIAL	General	Low SHORT-TERM returns from investments	5	5	5	5		3	4	3	1	3,9	1,5	1	5	5	4		3	4	4	1	3,4	1,6
FINANCIAL	General	Short term and small scale bias	4	5	4	2	5	4	4	4	2	3,8	1,1	5	5	3	3	5	4	4	5	1	3,9	1,4
GOVERNANCE	General	Bureaucratic issues or delays in authorising the work or receiving work permits	5	1	4	3	4	5	3	4	4	3,7	1,2	3	1	5	3	4	5	3	3	4	3,4	1,2
FINANCIAL	General	Lack of economic resources to invest in restoration actions	5	3	5	5	5	2	2	2	3	3,6	1,4	4	3	4	4	5	4	3	2	2	3,4	1,0
GOVERNANCE	General	Limitations in coordinated decision making	5	2	2	2	5	5	5	2	3	3,4	1,5	5	5	2	2	5	5	2	3	3	3,6	1,4
GOVERNANCE	General	Negative social perception and pervasive inertia (i.e. passive actitude of institutions and other stakeholders)	4	5	3	4	4	3	3	2	3	3,4	0,9	4	5	4	3	5	2	3	2	3	3,4	1,1
TECHNICAL	Further	Acute degradation level and divergence in target state	3	3	5	5		3	1	4	3	3,4	1,3	2	3	5	5		3		4	3	3,6	1,1
GOVERNANCE	General	Focus in short term policies	5	4	3	3	5	4	2	1	3	3,3	1,3	5	5	2	3	5	4	2	1	4	3,4	1,5
GOVERNANCE	General	Lack of social engagement in restoration activities	2	4	5	4	5	3	3	3	1	3,3	1,3	3	5	4	3	5	3	2	2	3	3,3	1,1
FINANCIAL	General	Business plans bound to local constraints	2	2	5	4	5	5	1	3	2	3,2	1,6	1	2	4	3	5	5	1	4	1	2,9	1,7
TECHNICAL	Further	Insufficient restoration pace/scale with uncertain benefits and tradeoffs	3	2	3	4	5	2	1	4	4	3,1	1,3	4	4	4	4	5	3	1	4	3	3,6	1,1
TECHNICAL	General	Difficulties with monitoring programs (e.g. scarce accessibility to wetlands, islands, etc.)	4	1	4	5	4	4	1	3	2	3,1	1,5	3	1	4	5	4	5	1	3	1	3,0	1,7
TECHNICAL	General	Lack of data and metrics for biodiversity	4	1	5	4	2	2	5	2	3	3,1	1,5	3	1	3	4	2	2	3	4	3	2,8	1,0
TECHNICAL	Further	Poor sequencing and limited compatibility with existing infrastructure		1	3	2	5	4	5	2	2	3,0	1,5		1	4	2	4	5	5	2	2	3,1	1,6
TECHNICAL	General	Mismatch between socioeconomic needs and restoration works (e.g. interventions	3	1	4	1	5	4	4	4	1	3,0	1,6	5	1	1	1	5	5	4	5	1	3,1	2,0

		overlapping with bathing season)																						
TECHNICAL	General	Lack of physical room for restoration (e.g. beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)	4	1	2	2	3	4	5	1	4	2,9	1,5	2	1	1	1	3	4	4	1	3	2,2	1,3
TECHNICAL	General	Limited engineering and ecological expertise (e.g. current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)	4	1	4	2	5	4	1	1	3	2,8	1,6	5	1	5	1	5	5	1	2	3	3,1	1,9
GOVERNANCE	General	Lack of laws and policies engaging conservation, management and restoration of natural environments	3	1	1	3	2	5	5	3	2	2,8	1,5	4	1	1	3	3	5	3	2	4	2,9	1,4
TECHNICAL	General	Delayed performance of restoration projects	2	1	3	3	5	3	2	2	2	2,6	1,1	5	1	4	2	5	2	1	2	1	2,6	1,7
TECHNICAL	General	Mismatch between protected species ecology and restoration works (e.g. interventions overlapping with bird nesting season)	3	5	5	1	4	1	1	1	2	2,6	1,7	2	5	1	1	4	1	1	1	1	1,9	1,5

Barriers were represented according to their relevance and frequency by a scatter graph. In this graph, the frequency is a function of relevance, and the distribution of the barriers was represented according to these parameters to bring a complementary approach to barriers that should be prioritized in the coastal restoration upscaling at a REST-COAST project scale. In the upper right quadrant, barriers with the highest scores were collected. For the technical barriers (Figure 58) 10 of the 12 identified barriers were depicted in the upper right quadrant but with a considerably dispersion within this area. The "**Physical context specific of the site (e.g., terrain typology, watershed, hydrological context, sand availability...)**", "**Lack of data and metrics for ecosystem services, ecological processes and functions"** and the "**Difficulties related to management plans**" were the technical barriers identified as most relevant and frequent at the REST-COAST project scale. This were followed by other technical barriers that were more diluted in the aggregated analysis with the 3 categories of barriers. Thus, "**Acute degradation level and divergence in target state**" and "**Insufficient restoration pace/scale with uncertain benefits and trade-offs**" fell within the relevant and relatively frequent technical barriers. With a lower frequency, a group of 5 barriers was depicted around the intersection of the score value 3 for relevance and frequency, respectively. Only two barriers fell in the lower right quadrant "**Lack of physical room for restoration (e.g., beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)**" and "**Mismatch between protected species ecology and restoration works (e.g., interventions overlapping with bird nesting season)**". Any barrier scored less than 2.5 for relevance nor less than 1.9 for frequency.

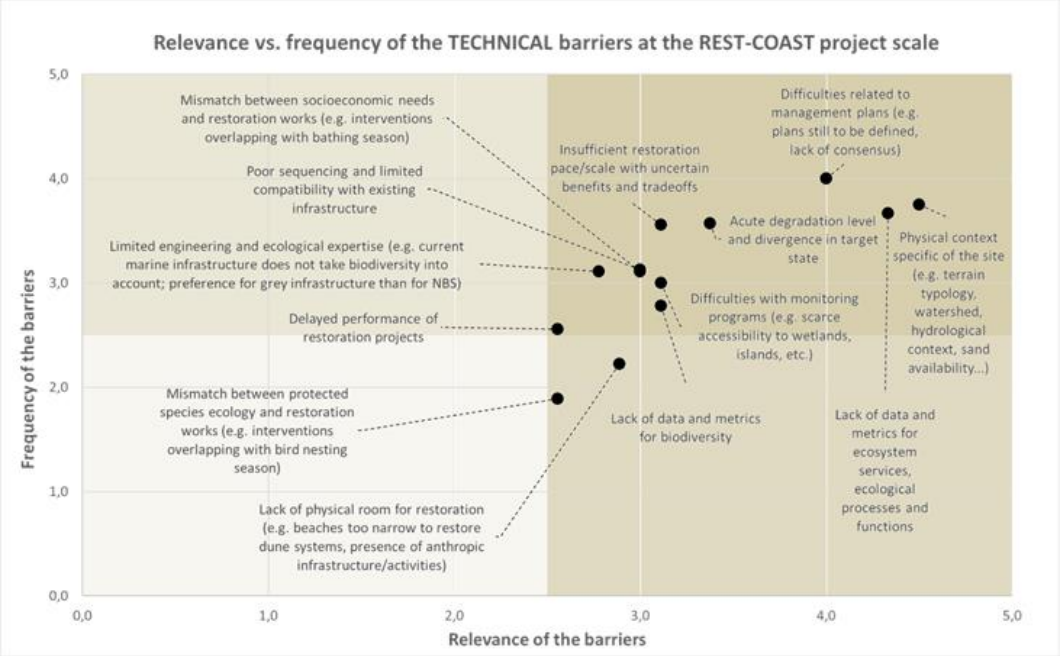

Figure 58. Relevance and frequency of the technical barriers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the barriers is a function of the relevance.

Since barriers are potentially interconnected, it was relevant to explore the trends that emerge for the other two categories included in the present analysis. For governance barriers, again a concentration of elements in the upper right quadrant of the graphic (Figure 59) was observed, with no barriers scoring on average less than 2.8 over 5 for relevance and 2.9 over 5 for frequency. This shows that governance barriers were relatively common and important in the practice of coastal restoration, as factors that can hamper restoration's success. On the top of that, "**Dealing with socioeconomic needs" is the most relevant and frequent governance barrier, together with the** "**Lack of integrated approach (i.e., interdisciplinary and coordinated action among stakeholders)**" and the "**Lack of convergence in stakeholders' interests**". Bureaucracy was another relevant factor that often limits restoration activities, having significant differences for countries and regions.

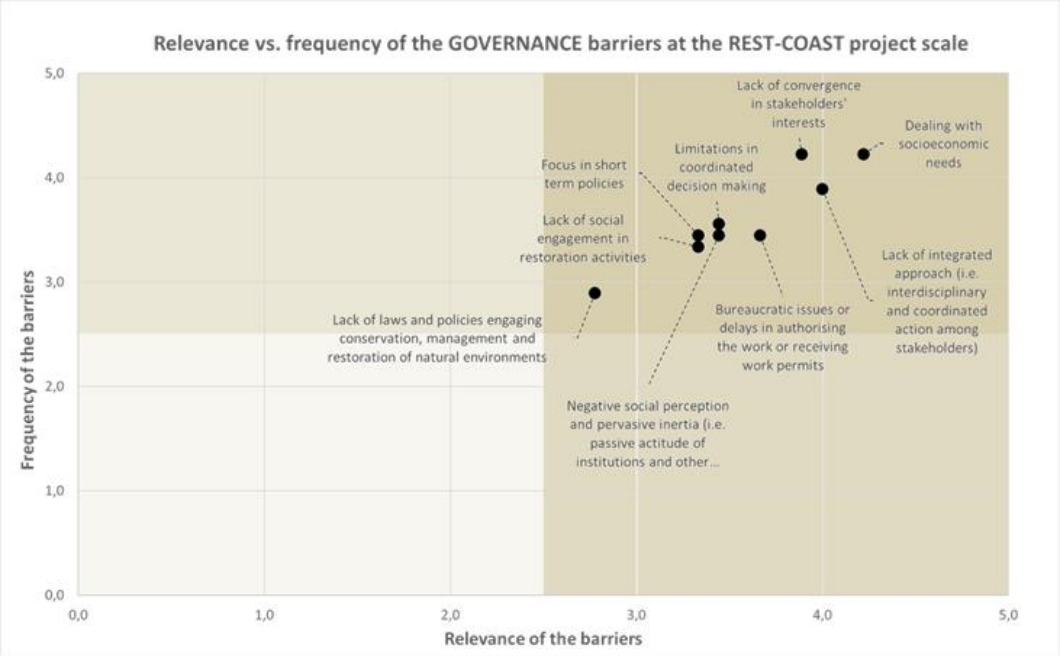

Figure 59. Relevance and frequency of the governance barriers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the barriers is a function of the relevance.

Financial barriers also scored in the upper right quadrant of the graphic (Figure 60), with no barriers scoring on average less than 3.2 over 5 for relevance and 2.9 over 5 for frequency. The "**Lack of long-term economic support**" was leading the ranking of financial barriers, followed by the "**Low benefit-cost ratios (or a lack of cost-benefit evaluation)**", both as the most relevant and frequent. The "short term" is a relevant concept that arises retaled to the need for returns on restoration investments or short term and small-scale approaches to restoration projects that limit their potential to have a positive impact.

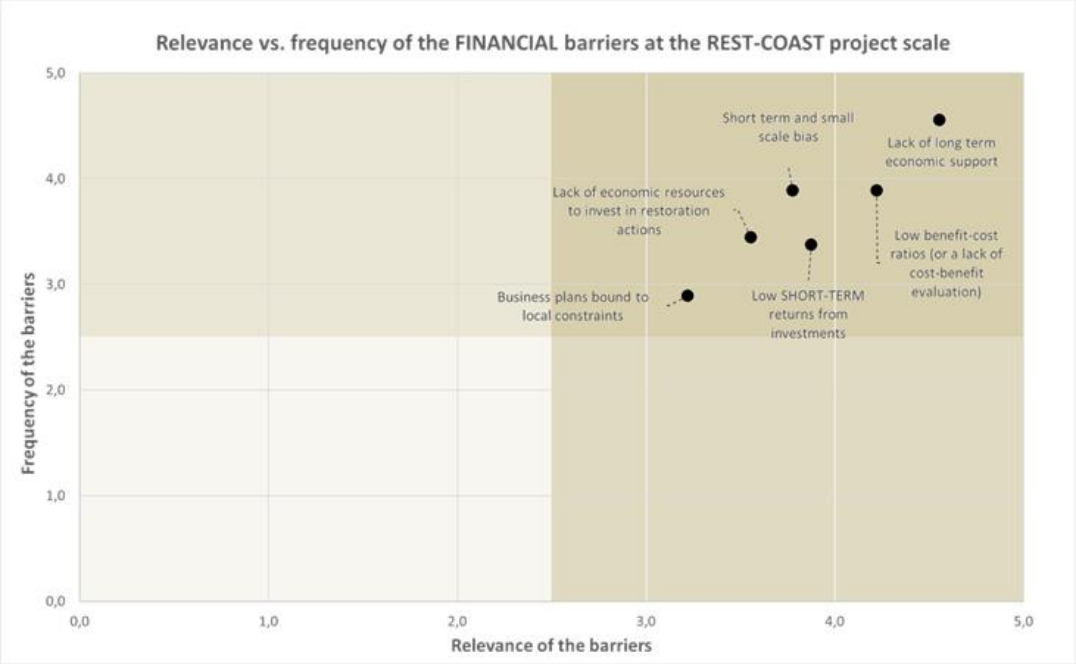

Figure 60. Relevance and frequency of the financial barriers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the barriers is a function of the relevance.

7.3.3 Enablers to coastal restoration upscaling

This section shows the overall enablers analysis in the REST-COAST project in the three dimensions explored. The first part compiles the global list of the identified enablers in this analysis, that is, those were proposed by the Pilots and SHs of each of the Pilot cases of the project, which expand the conceptual framework that was the basis of D1.2. (Sánchez-Arcilla *et al*. 2022). Secondly, results of the quantitative analysis are presented, in which the enablers were prioritized according to the relevance and the frequency determined by concerning the convergence between the SHs and Pilot perspectives for the overall project consortium. Finally, in the last part of the present section, the graphical representation of relevance and frequency of technical, governance and financial enablers is analysed at a global project scale.

7.3.3.1 Global list of enablers in the REST-COAST project

As done for the barriers, SHs and Pilot scientific teams also had the opportunity to introduce new complementary enablers to those present in the paper from Sánchez-Arcilla *et al*. 2022. An aggregated version[23] of the proposed enablers is presented here (Table 56). This initial version of the proposed enablers includes some heterogeneity, covering not only genuine ones that may respond to local particularities but also slight differences with others that are also present in the Sánchez-Arcilla *et al*. work. A next step would be necessary to process this information and being able to distinguish relevant local singularities from redundancies. To do so, a further iteration to discuss it within the local CORE-PLATS is recommended.

[23] A detalied analysis of the proposed enablers can be found in the Specific results per Pilot section.

Table 56

Proposed technical, governance and financial enablers gathered in the different Pilots. For each Pilot, barriers proposed by the scientific and technical team of the Pilot are distinguished from the ones suggested by key local SHs.

		Enablers		
		Technical	Financial	Governance
Wadden Sea Pilot	Pilot			
	SHs		1. Through interventions in the area, there will be future prospects and job retention.	
Ebro Delta Pilot	Pilot	1. The urgent need for facing and tackling coastal restoration, by growing willingness of social inertia in the territory and international directives.	1. International interest in investing in low cost/effective policies and projects regarding coastal restoration.	1. Existance of project calls which enable new governance models, based on participation and co-creation approaches.
	SHs		1. New green deal european funds. 2. Next generation (a lost opportunity??)	1. Creation of the Climate Resilience Center (CRC). 2. The CRC can be a good place to find consensus in decision-making.
Venice Lagoon Pilot	Pilot			
	SHs		1. The funds are there but they are spent badly. 2. Funds linked to pecific projects. 3. There have been specific projects over the years, but with the limit of being extemporaneous.	
Vistula Lagoon Pilot	Pilot	1. Low population density may become an asset for biodiversity restoration if outside financing is provided through coastal authorities.		
	SHs	1. The very construction of the island and the emergence of a potential habitat for birds.	1. Financing the construction of the island from investment funds. 2. The use of the investment potential of "Construction of the waterway..." to combine the need to deposit spoil with the subsequent use of the island to support biodiversity.	1. Responsibility for the island lies in the hands of the Office dealing with the management of the coastal zone, so the case study is based on the most competent institution.
Foros Bay Pilot	Pilot	1. Improved knowledge on both structural and functional relations that exist between different ecological units (e.g. seagrass meadows, macroalgal meadows, coastal wetlands, estuaries, watershed-coastal connectivity etc.) . 2. Improved knowledge on both structural and functional relation that exists within socio-ecological systems. 3. Improved knowledge and advanced modelling on application of NbS approches in solving specific ecological problems.		
	SHs	1. Improved knowledge on technical barriers that prevent natural restoration; improved knowledge and experience in NbS solutions.		
Rhone Delta Pilot	Pilot			
	SHs			
Sicily Pilot	Pilot			1. Advocacy group actions (usually ONGs).
	SHs			
Arcachon Bay Pilot	Pilot	1. Master local conditions and pressure to enable key species settlement and resilience.	1. Innovative model to value ecosystem services for local stakeholders and to incitate restoration upscalling beyond the objectives of biodiversity restoration only.	
	SHs			
Nahal Dalia Pilot	Pilot			

	SHs	1. Management and maintenance processes are lacking. There are budgets for construction, not operation and maintenance. 2. It is necessary, as stated, to state the desired rehabilitation actions and to hear the discussions of the positions of the stakeholders regarding them. 3. Models can help, only subject to concrete guidelines. 4. There is a plan for managing the overlap in the council. 5. Master Plan for the ICZM Coastal Area (Moshe Lenner). 6. High awareness and mobilization of local bodies and residents to protect the coastal environment (tar event in 2021). 7. Planning and consent are a prerequisite for any planning of a rehabilitation operation. 8. Mapping needs and then solving the "how".	1. Development of a business model – at the stage of operation and maintenance. 2. All of the above moves complement each other. Increasing funding sources is important for long-term maintenance, for preserving rehabilitation. 3. Innovative models and tools are important for assessing economic feasibility, as an incentive for stakeholders, some of whom are business entities, for whom profit and return on investment are important.	

7.3.3.2 Enablers: A quantitative analysis of its relevance and frequency

In this section the quantitative differences are shown between the priority enablers in the REST-COAST project. Same as the criterion adopted in the Pilot analysis, relevance gained importance over frequency, considering this last variable as a function of the previous one. The value of the relevance of the enablers was between 1 (no importance) and 5 (absolutely relevant). In the analysis, the enablers scored between 4 and 5 were considered "highly relevant enablers" while enablers between 1 and 3 were considered "less relevant enablers".

- A total of 13 enablers were identified and valued in the overall REST-COAST project, including technical but also financial and governance ones.
- Only 1 enabler (8%) of those diagnosed was highly relevant (valued between 4 and 5) while 11 enablers (92%) were less relevant (between 1 and 3).
- Going into in depth to the highly relevant enablers, it was observed that technical enablers were the only ones (100%) considered highly relevant on average within the 9 REST-COAST pilot cases.

The only highly relevant enabler was "**Advanced forecasting models that support connectivity restoration (e.g. sediment transport modeling)**" with an average relevance of 4.0. Being less restrictive, a group of 9 enablers (69%) that scored in relevance higher than 3.0 was observed[24].

The value of the frequency of the enablers was between 1 (this enabler never occurs) and 5 (this enabler always occurs). In the analysis, enablers scored between 4 and 5 were considered "highly frequent" while the enablers scored between 1 and 3 were considered "less frequent". Considering these criteria any enabler scored as highly frequent.

Considering the overall scale of the REST-COAST project, enablers scored lower on average than barriers in relevance and frequency. In general, there were difficulties for some teams in the project when considering that potential enablers are present in their area to enhance restoration actions. Thus, the results on the enablers could include a certain bias considering not only the enablers that have already been observed by the Pilots. Also, factors that Pilots objectively identified as potential enablers, but that are not usually observed to occur with a direct cause, end.

The following table (Table 57) contains the complete list of all the enablers arranged from the degree of relevance as well as how frequently the Pilots must deal with them. In addition, the relevance and frequency

[24] Considering that this threshold is less exigent than the treshold of 3.5 used to analyze "relevant" barriers.

scores of the Pilots were compared with the REST-COAST average of each of the enablers. According to that, the highly relevant enabler "**Advanced forecasting models that support connectivity restoration (e.g., sediment transport modeling)**" rarely takes place in some Pilots (e.g., Foros Bay, Nahal Dalia or the Ebro Delta). This can highlight the potential of forecasting as a facilitator in other Pilots, from which lessons can be learned. A higher variability was also seen in enablers frequency, with high values of standard deviation in most of the cases.

Table 57

Ranking of the total enablers for coastal restoration upscaling identified in the REST-COAST project, including technical, governance and financial ones (categories are depicted in purple in barrier type 1). Enablers are ordered according to their relevance, as the average of the 9 Pilots (from highest, depicted in dark green, to lowest relevance, light green). The same color gradient is used to highlight the average frequency of the enablers. The table also shows the data from the 9 Pilots of the project, as well as the standard deviation within the REST-COAST project. The last is depicted with a red gradient, to emphasize higher deviations with dark red.

			RELEVANCE of this ENABLER at pilot sites											FREQUENCY of this ENABLER at pilot sites										
ENABLER type 1	ENABLER type 2	LIST OF ENABLERS	Ebro Delta Pilot	Rhone Delta Pilot	Venice Lagoon Pilot	Vistula Lagoon Pilot	Foros Bay Pilot	Sicily Pilot	Nahal Dalia Pilot	Arcachon Bay Pilot	Wadden Sea Pilot	Relevance REST-COAST average	Desvest Relevance REST-COAST	Ebro Delta Pilot	Rhone Delta Pilot	Venice Lagoon Pilot	Vistula Lagoon Pilot	Foros Bay Pilot	Sicily Pilot	Nahal Dalia Pilot	Arcachon Bay Pilot	Wadden Sea Pilot	Frequency REST-COAST average	Desvest Frequency REST-COAST
TECHNICAL	GENERAL	Advanced forecasting models that support connectivity restoration (e.g. sediment transport modeling)	5	5	4	3	2	4	4	4	5	4,0	1,0	1	5	4	3	1	5	2	5	5	3,4	1,7
TECHNICAL	GENERAL	Willingness to promote restoration among stakeholders	1	5	4	4	2	5	5	5	4	3,9	1,5	3	5	3	4	1	5	5	3	5	3,8	1,4
GOVERNANCE	GENERAL	New policies towards decarbonised coastal protection (e.g. NBS vs. Grey infrastructure)	4	5	5	2	2	4	1	5	3	3,4	1,5	4	5	2	2	1	2	1	4	3	2,7	1,4
FINANCIAL	GENERAL	Increasing restoration funding	4	2	5	2	1	5	5	3	4	3,4	1,5	4	2	2	2	1	1	5	3	3	2,6	1,3
GOVERNANCE	GENERAL	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)	4	2	3	4	5	1	3	5	3	3,3	1,3	4	1	4	4	2	1	3	5	4	3,1	1,5
FINANCIAL	GENERAL	Innovative value-capture instruments and business models	4	1	4	3	1	5	5	5	1	3,2	1,8	4	1	3	3	1	3	5	5	1	2,9	1,6
TECHNICAL	GENERAL	Proactive maintenance with performance indicators	1	1	5	4	2	5	5	4	2	3,2	1,7	1	1	2	3	1	5	4	4	1	2,4	1,6
GOVERNANCE	GENERAL	Explicit accounting of coastal natural capital (biodiversity and ecosystem services)	1	5	3	2	3	3	5	4	3	3,2	1,3	1	5	2	2	1	1	3	3	3	2,3	1,3
GOVERNANCE	GENERAL	Continued training for deeper stakeholder involvement	2	5	4	1	2	4	5	2	4	3,2	1,5	1	2	3	1	1	4	5	2	2	2,3	1,4
TECHNICAL	GENERAL	Implementation and planning with a safe operating physical space (i.e. safety from flooding, erosion, etc.)	1	1	5	3	1	5	4	4	2	2,9	1,7	2	5	4	1	1	4	4	1	1	2,6	1,7
TECHNICAL	GENERAL	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	4	2	5	2	1	2	3	3	3	2,8	1,2	2	5	2	2	1	2	3	2	1	2,2	1,2
GOVERNANCE	GENERAL	New plans for transition in governance (promoting participation and sharing the benefits)	2	1	4	2	1	4	5	2	3	2,7	1,4	3	3	2	2	1	4	5	2	3	2,8	1,2
FINANCIAL	GENERAL	Improved capacity to develop business models and bankable plans	4	1	3	3	1	1	5	4	1	2,6	1,6	5	1	2	3	1	1	5	5	1	2,7	1,9

The enablers were represented according to their relevance and frequency by a scatter graph. In this graph, frequency is a function of relevance, and the distribution of enablers was represented according to these parameters to bring a complementary approach to enablers that should be prioritized in the coastal restoration upscaling at a REST-COAST project scale. This is also a different perspective that explores the

qualitative implications of enablers. In the upper right quadrant, enablers with the highest scores were collected.

For the technical enablers (Figure 61) 2 of the 5 identified were depicted in the upper right quadrant but with a considerably dispersion within this area. The "**Advanced forecasting models that support connectivity restoration (e.g., sediment transport modeling)**" and "**Willingness to promote restoration among stakeholders"** were the technical barriers identified as most relevant and frequent at the REST-COAST project level. This were followed by other two technical enablers that were less frequent and relevant depicted around the intersection of the two quadrants, falling close or within it. These were "**Proactive maintenance with performance indicators**" and "**Implementation and planning with a safe operating physical space (i.e., safety from flooding, erosion, etc.)**". Finally, the "**Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)**" was seen with a lower potential to facilitate river restoration actions.

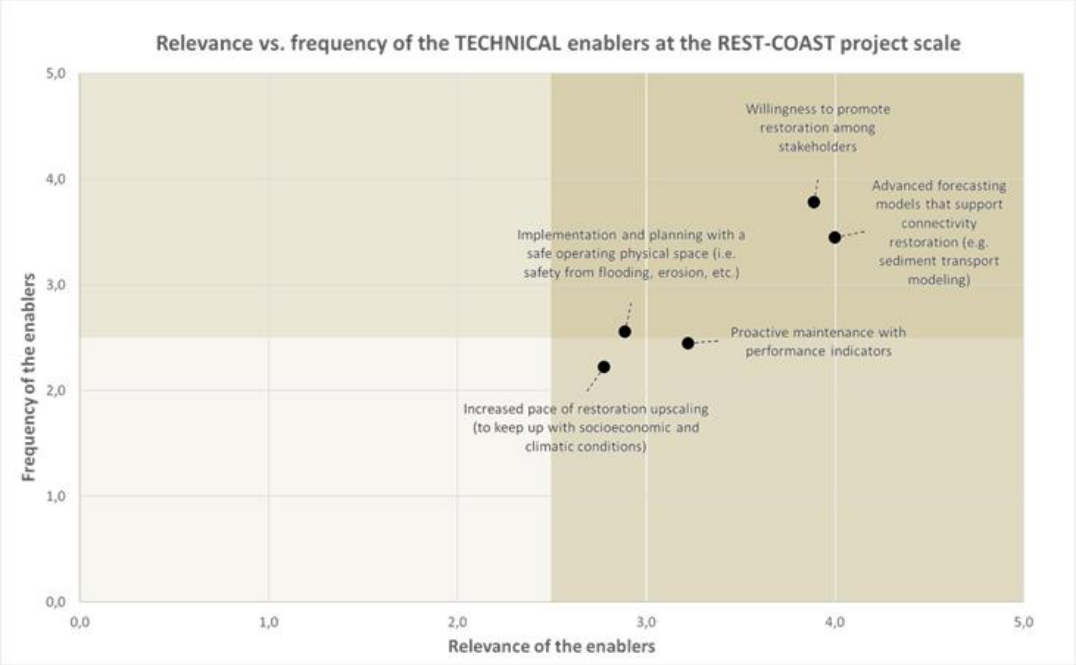

Figure 61. Relevance and frequency of the technical enablers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the enablers is a function of the relevance.

Some of the above-mentioned technical enablers might be considered together with governance and financial to explore its potential to improve coastal restoration at a REST-COAST project scale. In fact, governance enablers were the most widely perceived by SHs in the Pilots as potential factors to boost the practice of coastal restoration. For governance barriers, a concentration of elements closer to the centre of the graph was observed, but still located in the upper right quadrant (Figure 62). "**New policies towards decarbonised coastal protection (e.g., NBS vs. Grey infrastructure)**" and "**There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)**" were the leading enablers in terms of relevance and frequency. The last one was also the most frequent enabler reported, that also connects with some of the new trends in governance that should be explored in the framework of the REST-COAST project.

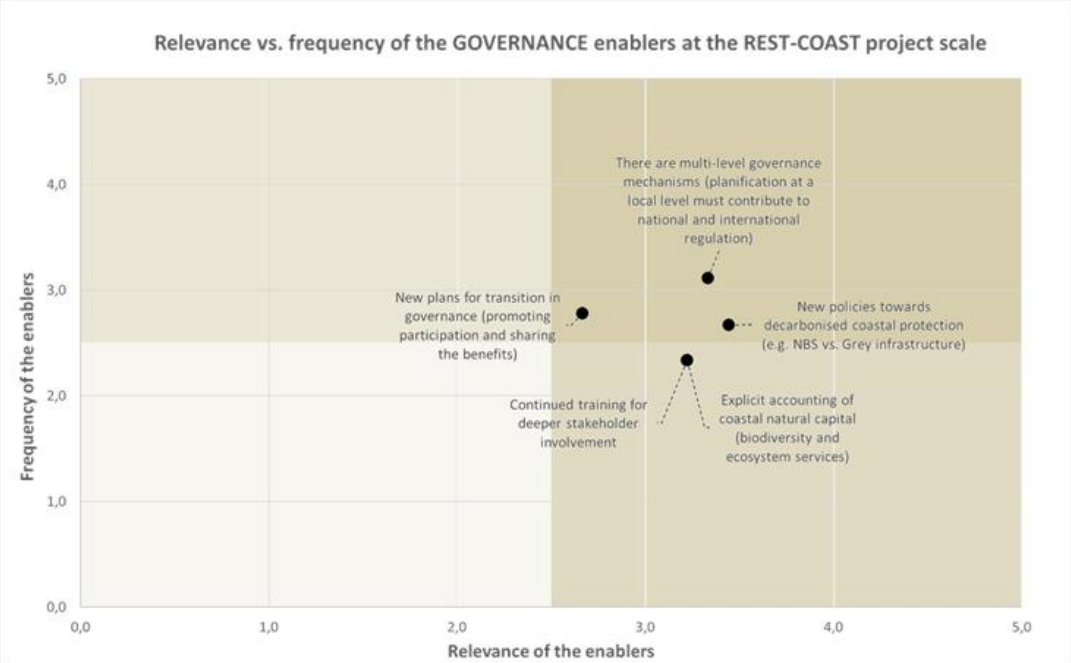

Figure 62. Relevance and frequency of the governance enablers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the enablers is a function of the relevance.

Finally, financial enablers also scored a little lower in the upper right quadrant of the graphic (Figure 63), with no enabler scoring on average less than 2.6 over 5 for relevance and 2.7 over 5 for frequency. The "**Increasing restoration funding**" was seen as a relevant enabler but its frequency was low. Although this could boost the practice of restoration by bringing higher economic inputs to the projects (with a potential to increase its extension and impact), which is not something perceived as usual by restoration practitioners.

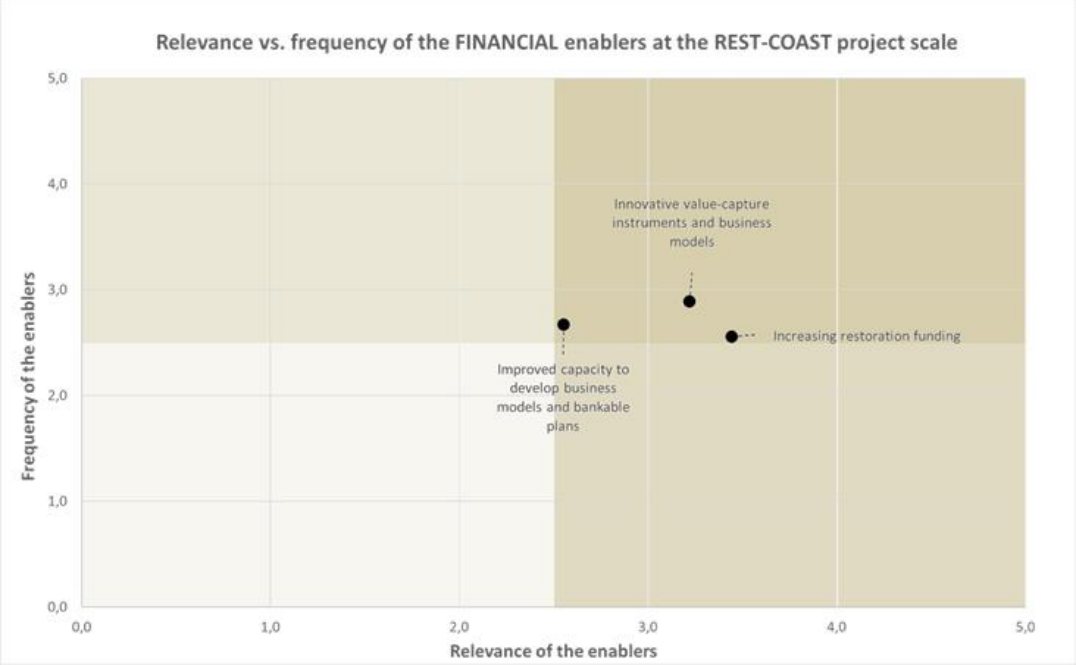

Figure 63. Relevance and frequency of the financial enablers at the REST-COAST project scale, integrating the results obtained in the 9 pilot cases. The frequency of the enablers is a function of the relevance.

Other innovative formulas that are also on the focus of business models and economic value creation in the REST-COAST project do not take place very frequently but were still perceived with some relevance to act as enablers.

8 Main findings and general recommendations

Deliverable 1.2 (D1.2) has the goal of identifying mainly technical barriers and enablers for coastal restoration upscaling. This is an essential step within WP1 to pave the way to tackle management gaps in coastal restoration, overcoming restoration barriers (technical, governance, and financial), as well as identifying and fostering potential enablers. As a conclusion, it is considered that **the main goal of this analysis was fulfilled, since updated and exhaustive information was obtained, not only qualitative but also quantitative, on the relevance and frequency of technical, governance and financial barriers/enablers in the Pilot sites to establish priorities and guidelines for hands-on coastal restoration**. In this sense, this deliverable (D1.2) makes available to the REST-COAST project team, and also to the stakeholders and restoration practitioners in general, **a comprehensive review of the barriers and enablers of coastal restoration that will encourage future discussion and the co-creation in CORE-PLATS becoming beyond an exhaustive compilation, a useful tool for hands-on coastal restoration in the 9 pilot sites of the project and to drive the scaling up on a REST-COAST scale as well**. Furthermore, the restoration barriers and enablers identified in this report also connect directly with other Work Packages of the project, mainly as WP3 on "Financial arrangements/business plans for restoration upscaling", and WP5, due to the consideration of governance perspectives and SHs engagement. The potential raising awareness to local stakeholders about the relevance of considering barriers and enablers for the future of coastal restoration (and which connects with WP6) cannot be underestimated either.

The level of engagement with all the activities carried out in this analysis is considered very high. Not only internally, with a high level of implication from all 9 REST-COAST Pilots in the project (Wadden Sea, Venice Lagoon, Ebro Delta, Foros Bay, Nahal Dalia, Rhone Delta, Vistula Lagoon, Arcachon Bay and Sicily Lagoon), that answered on time representing 100% of participation. Also, the engagement of external SHs through the methodological design of this deliverable was successful. **Thus, from a global REST-COAST perspective, a total of 55 SHs organisations participated in the present analysis for this Deliverable 1.2 through an on-line form**. This is considered a very good participation result, which brought genuine and large-scale insights into the factors that can block or facilitate the practice of coastal restoration. The effort made in this technical report **to collect not only the expert criteria on coastal restoration from each Pilot's team but also the perspectives of key local SHs from different sectors to integrate the knowledge and interests of all parties involved in coastal restoration is valuable to obtain a global picture that integrates the main technical limitations (barriers), successful solutions (enablers) and good practices for coastal restoration upscaling**. This is the first step for the co-design and co-implementation of hands-on coastal restoration between the different parties in pilot sites and CORE-PLATs.

In terms of SHs participation, it is worth to highlight the relevance of the participation of public authorities in the discussion around barriers and enablers for the future of coastal restoration upscaling since many of them have competencies or are directly involved in planning and management activities in the Pilot areas. Therefore, bringing them on board at an early stage of the REST-COAST project is also remarkable. Third sector organisations (NGOs) and Research and education were also widely represented, and this is relevant, too. On the one hand, both environmental organisations and research and education organisations, might be locally involved in projects related to nature conservation that have to do with ecosystem management, dissemination, and public participation. On the other hand, they are interesting players due to its background in the practice of coastal restoration. This can be an advantage to put the focus in the most relevant issues, not only environmental but also social, that may constraint future actions. Finally, local companies and professional committees took part of this analysis as a small proportion of the total participation. However, it is worthwhile, as some of these committees represent the interests of a sector or bring together several smaller organisations. Consequently, the interaction within the project and the CORE-PLATS arises as a good

opportunity to discuss with public authorities, researchers, and activists, among others, at a high technical level, also disseminating the concepts that are on the core of the REST-COAST project itself (as NBS, ESS, soft vs hard engineering, climate change adaptation, forecasting, co-creation and many more). Accordingly, **the results obtained show that stakeholders feel a very good environment for discussion in the CORE-PLATS** with some small differences among Pilots.

In addition, the results showed that, *de facto*, **all CORE-PLATS were operating**. This positive result in terms of the existence of CORE-PLAT constitutes an essential basis for the current analysis on barriers and enablers. Furthermore, most of the Pilots had implicitly considered barriers and enablers to restoration projects in their previous interactions with local SHs. Consequently, most of key local SHs were somewhat familiar with a certain degree of discussion on barriers and enablers for coastal restoration. This is a direct positive effect of the CORE-PLATS that could have helped with the good participation results achieved in this analysis as well as promoting a good environment for discussion.

SHs feel that barriers have been a relevant factor that has hampered coastal restoration efforts in the past in their pilot areas. In addition, **SHs' perceptions point to governance as the keystone of coastal restoration in the REST-COAST pilot areas**. **This result is aligned with the project framework**, which is based on a combination of technical, financial and management innovations that can support a shift in governance and perception to enhance social engagement to restoration (Sánchez-Arcilla *et al.* 2022).

At the pilot level, in general, there was a high level of agreement between the perspectives of the Pilots and the SHs regarding the identified barriers and enablers for coastal restoration. Therefore, in most of the REST-COAST pilot sites, the results of the Pilot's analysis were consistent with the SH's perspective, which may be key to facilitate discussion in the CORE-PLATs of the different pilot sites, since they have close visions in terms of barriers considered a priority to address because they may become a strong impediment to coastal restoration and enablers that could be a valuable opportunity to facilitate coastal restoration upscaling.

Relevance and frequency of barriers observed in the results also point to the alignment of the conceptual framework based on the work from Sánchez-Arcilla *et al.* 2022 with the meaningful topics for practitioners involved in restoration projects in the REST-COAST consortium. Further aspects within this framework have been disclosed in a qualitative and quantitative manner in this exercise. In this context, barriers' results perform better than enablers, in terms of reaching higher average relevances and frequencies at an overall REST-COAST project scale. Thus, enablers scored on average lower than barriers in relevance and frequency. In general, there were difficulties for some teams in the project when considering that potential facilitators do take place in its area to enhance restoration actions. Thus, results on enablers might include a certain bias considering not only enablers that have already been observed by Pilots. Also, factors that are objectively identified by Pilots as potentially relevant enablers, but that are not usually observed to occur with a direct cause, end. This is something that should be considered at a project scale, to explore and share best practices around enablers and promote them.

In addition, in this report, the relevance and frequency results of each Pilot were compared with the REST-COAST average of each of the barriers and enablers to integrate the Pilots within the global analysis of the 9 Pilots of the REST-COAST project. **This was very useful to detect similarities and deviations between different pilot sites of the project regarding their technical, governance and financial barriers and enablers and constitute the first step towards establishing a cooperative framework to address the barriers and enablers to coastal restoration in the different REST-COAST Pilots**. On the one hand, regarding the similarities, it is recommended that the Pilots who share similar barriers or enablers to coastal restoration could work together to share their knowledge and experiences to find synergies to address these barriers and create opportunities. On the other hand, considering the deviations with respect to other Pilots, it is proposed that the Pilots address their barriers and facilitators by integrating the knowledge and experiences of the global REST-COAST to

integrate lessons learned in other Pilots in the restoration actions of each Pilot site as well as generate new opportunities from enablers that are relevant and frequent in other Pilots.

As a complement to the barriers present in the work from Sánchez-Arcilla *et al.* 2022, **the SHs and Pilot scientific teams also had the opportunity to introduce new barriers and enablers that they consider hinder coastal restoration or that could be valuable opportunities**. A next step would be necessary to process this information and be able to distinguish relevant local singularities from redundancies. To do so, a further iteration is recommended to discuss it within the local CORE-PLATS.

At the Pilot scale, a variety of key findings have also provided relevant information to be integrated in the next steps of the REST-COAST project. This report highlighted the fact that the analysis of barriers for each Pilot site has been unique. This is because they faced diverse barriers due to their specific context and because they are currently in different stages of restoration, different timelines on their restoration plans and differences in actual progress (shown in month 18). Hence, the barriers can vary greatly between Pilots since not all of them are in the exact stage of restoration. There may be some barriers which are only encountered in the initial stages of restoration (e.g., governance and bureaucratic barriers), while others may predominate later in the restoration process. Thus, **it would be advisable to assess all these barriers and enablers throughout different times in the REST-COAST project with the aim of understanding their links with the actual restoration progress and timelines for each Pilot**.

Finally, as can be seen in the detailed analysis of each of the nine Pilots, **all the above-mentioned barriers and enablers (technical, governance and financial) to coastal restoration are also interconnected**. This perspective has been widely explored from an individual Pilot perspective: the connections between the technical barriers/enablers of each pilot site with the governance and financial ones were analysed considering the Pilot perspective and integrating the new enablers proposed by the Pilot. The results of this part of the analysis were valuable to identify, on the one hand, the possible amplification of the "barrier effect" of technical barriers interconnected with other governance and financial barriers becoming a stronger impediment to coastal restoration; and on the other hand, the enablers that are being amplified by other type of enablers and they could be a good opportunity to promote and facilitate the coastal restoration upscaling. **The present analysis of the D1.2 results will require a further iteration within the Pilots CORE-PLATS, to put it in common and promote a discussion around the similarities with the consortium and particularities of each area.**

9 Acknowledgements

The writing team warmly thanks the participation of the 9 Pilot sites (Wadden Sea, Venice Lagoon, Ebro Delta, Foros Bay, Nahal Dalia, Rhone Delta, Vistula Lagoon, Arcachon Bay and Sicily Lagoon) and its CORE-PLATS in the preparation of this deliverable. Its commitment with the proposed tasks has been essential to conduct this analysis of barriers and enablers for coastal restoration upscaling.

Our team acknowledges all the local stakeholders who took part in the survey. Their inputs made this analysis more valuable.

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11 Annexes

Annex I: Surveys

Pre-diagnosis form for the REST-COAST Pilots

1. What's the name of your Pilot/ Fellow case in REST-COAST?
    - Wadden Sea/Ems Dollard (NLD, DEU, DNK)
    - Ebro Delta (ESP)
    - Venice lagoon (ITA)
    - Sicily Med Island (ITA)
    - Rhone Delta (FRA)
    - Arcachon Bay (FRA)
    - Vistula Lagoon (POL)
    - Nahal Dalia (ISR)
    - Foros Bay (BGR)

2. Is your pilot CORE-PLAT already operating?
    - Yes
    - No
    - Other

3. Have you already been discussing about barriers and enablers for coastal restoration projects in your CORE-PLAT?
    - Yes
    - Not yet
    - Other

4. If you have answered YES to the previous question, please, could you write a brief paragraph about how this discussion took place? (format, participants, achievements, etc.)

5. How comfortable do you feel with filling a request on barriers and enablers for coastal restoration in your pilot case with your own info (expert criteria) considering also some stakeholders' perspectives? (Choose a value between 1 and 5)
1 = Not very comfortable, we don't have a lot of information about it.
5= No problem, we know a lot the situation and we can extrapolate our stakeholders perspectives about it.

6. We are considering the possibility of sending a form to key stakeholders in the CORE-PLATS to gather their impressions about enablers/barriers for restoration upscaling in your pilot. The form would remain open for a couple of weeks. Do you think it would be feasible in your pilot? Would you be able to send the form link to them?
    - Yes, please send a form!
    - Yes, although some SH may not answer
    - Let's talk about it to decide how to filter the SH

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The form for local stakeholders of each REST-COAST Pilot (CORE-PLAT)

Barriers and enablers for coastal restoration upscaling: Stakeholders' approach

Section 1

Thank you for joining this online questionnaire about barriers and enablers for coastal restoration upscaling in your pilot area within the REST-COAST project. As a stakeholder, your contribution is essential to us. It will take you less than 10 min to fill in. The form will remain open until next Thursday March 16th (included).

Additional info:

- Pilot hosts will help you with any issue related to the completion of this form. Please, if you have any questions or queries, contact the person who sent you this form.
- You should answer the survey considering your background and experiences around the region, rather than just considering the pilot you are involved with.
- All the information given in this survey will be treated anonymously.

INDIVIDUAL INFORMATION

We would like to collect some brief information about your organisation and the pilot case you belong to.

1.-If possible, write your organisation's name (NOT your personal info).

(open answer)

2.-To which category of stakeholders does your organisation belong?

- Government
- Local companies and economic associations
- Research institutions and education
- NGOs, the third sector, local community, etc.
- Local media
- Other

3.-In which sector is your activity developed?

- Agriculture and farming
- Fisheries
- Tourism
- Industry
- Commerce
- Consultancy
- Others...

4.-In which pilot case (CORE-PLAT) in the REST-COAST project are you involved as a stakeholder?

- Wadden Sea/Ems Dollard (NLD, DEU, DNK)
- Ebro Delta (ESP)
- Venice lagoon (ITA)
- Sicily Med Island (ITA)
- Rhone Delta (FRA)
- Arcachon Bay (FRA)
- Vistula Lagoon (POL)
- Nahal Dalia (ISR)
- Foros Bay (BGR)

5.-At the present time, how comfortable do you feel to discuss about barriers / enablers in your case-study restoration platform (CORE-PLAT)? (Choose a value between 1 and 5)

1 = Not so much...and this hinders the flow of information
5= Very much...I feel the CORE-PLAT is an open forum to discuss about concerns and ideas around coastal restoration

Section 2

BARRIERS for coastal restoration upscaling

Restoration is often limited by technical, financial and governance barriers that challenge. This may happen not only at a local level but also in a broad sense, leading to a widespread implementation of large-scale interventions. In this section of the form we want you to focus on coastal restoration barriers in your pilot area.

6.-In your opinion, which is the main BARRIER category to coastal restoration?

- Technical
- Financial
- Governance
- Others...

7.-In general, do you feel that BARRIERS have been a relevant factor that has hampered coastal restoration efforts in the past in your pilot area? (Choose a value between 1 and 5)

1 = No, I don't feel barriers might have had a relevant role in the past
5 = Yes, I feel we have seen restoration being hampered by barriers in the past

8.-TECHNICAL BARRIERS for coastal restoration: In your opinion, which are the technical barriers existing in your pilot area (select as many barriers as needed)?

- Background barriers specific of the site (e.g. terrain typology, watershed, hydrological context, sand availability...)
- Limited engineering and ecological expertise (e.g. current marine infrastructure does not take biodiversity into account; poor knowledge on NBS)
- Lack of data and metrics for biodiversity
- Lack of data and metrics for ecosystem services and functions
- Difficulties with monitoring programs (e.g. scarce accessibility to wetlands, islands, etc.)
- Difficulties with management plans (e.g. plans still to be defined, lack of consensus)
- Delayed performance of restoration projects
- Lack of physical room for restoration (e.g. beaches too narrow to restore dune systems)
- Mismatch between protected species ecology and restoration Works
- Mismatch between socioeconomic needs and restoration Works
- Others...

9.-TECHNICAL BARRIERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant barrier for your pilot area was missing in the last question) (Open answer)

10.-FINANCIAL BARRIERS for coastal restoration: In your opinion, which are the financial barriers existing in your pilot area (select as many barriers as needed).

- Lack of economic resources to invest in restoration actions
- Low benefit-cost ratios
- Low returns from investments
- Short term and small scale bias
- Business plans suited to local constraints
- Lack of long term economic support
- Others...

11.-FINANCIAL BARRIERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant barrier for your pilot area was missing in the last question) (Open answer)

12.-GOVERNANCE BARRIERS for coastal restoration: In your opinion, which are the financial barriers existing in your pilot area (select as many barriers as needed).

- Lack of integrated approach (i.e. interdisciplinary and coordinated action among stakeholders)
- Limitations in coordinated decision making
- Lack of social engagement in restoration activities
- Negative social perception and pervasive inertia (i.e. passive attitude of institutions and other stakeholders)
- Focus in short term policies
- Lack of convergence in stakeholders' interests
- Lack of laws and policies engaging conservation, management and restoration of natural environments
- Bureaucratic issues or delays in authorising the work or receiving work permits
- Dealing with socioeconomic needs
- Others...

13.-GOVERNANCE BARRIERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant barrier for your pilot area was missing in the last question) (Open answer)

Section 3

Innovation may help to overcome current barriers to restoration up and out-scaling. Again, this may happen not only at a local level but also in a broad sense. In this section of the form we want you to focus on enablers for coastal restoration in your pilot area.

14.-In your opinion, which is the main ENABLER category to coastal restoration?

- Technical
- Financial
- Governance
- Others...

15.-In general, do you feel that ENABLERS have been a relevant factor that has boosted coastal restoration efforts in the past in your pilot area? (Choose a value between 1 and 5)

1 = No, I don't feel any enabler might have had a relevant role in the past
5 = Yes, I feel we have seen restoration being unblocked by some enablers in the past

16.-TECHNICAL ENABLERS for coastal restoration: In your opinion, which are the technical enablers existing in your pilot area (select as many as needed)?

- Advanced forecasting models that support connectivity restoration
- Implementation and planning with a safe operating physical space (i.e. safety from flooding, erosion, etc.)
- Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)
- Proactive maintenance with performance indicators
- Willingness to promote restoration among stakeholders
- Others...

17.-TECHNICAL ENABLERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant enabler for your pilot area was missing in the last question) (Open answer)

18.-FINANCIAL ENABLERS for coastal restoration: In your opinion, which are the financial enablers existing in your pilot area (select as many as needed)?

- Increasing restoration funding
- Innovative value-capture instruments and business models
- Improved capacity to develop business models and bankable plans
- Others...

19.-FINANCIAL ENABLERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant enabler for your pilot area was missing in the last question) (Open answer)

20.-GOVERNANCE ENABLERS for coastal restoration: In your opinion, which are the financial enablers existing in your pilot area (select as many as needed).

- There are multi-level governance mechanisms
- Explicit accounting of coastal natural capital
- New policies towards decarbonised coastal protection
- New plans for transition in governança
- Continued training for deeper stakeholder involvement
- Others...

21.-GOVERNANCE ENABLERS for coastal restoration: Would you like to elaborate a bit more about it? (please, also use this space if more than one relevant enabler for your pilot area was missing in the last question) (Open answer)

22.-THANK YOU VERY MUCH FOR YOUR TIME! If you have any suggestions concerning barriers or enablers for coastal restoration, please write here below! (Open answer)
Annex II: Instruments to collect information from the nine Pilot cases

ARPHA Preprints *Author-formatted document posted on 30/10/2023*. DOI: https://doi.org/10.3897/arphapreprints.e114825

A. Instrument to collect quantitative information about barriers and enablers to coastal restoration upscaling at each Pilot site based on their own expert criteria

Dear REST-COAST colleagues,
the goal of this tool is to collect QUANTITATIVE information about barriers/enablers to coastal restoration upscaling at your pilot site, with emphasys in **technical aspects**. Please **go through all the 6 tabs of this Excel file**, filling in (grey cells) or selecting the options from the dropdown list (blue cells). A Word document has also been sent, that you are invited to use for providing a QUALITATIVE description of barriers/enablers at your pilot site: there, you will be able to explain some of the answers you will give in this spreadsheet**.** Thank you for your time! *In case of any questions please contact with Ferran Bertomeu (ferran.bertomeu@eurecat.org) and Laura Puértolas (lpuertolas@albirem.com).*

Pilot name	
Country	
Name of your organization	

			How relevant is this BARRIER/ENABLER at your pilot site? *Please choose from the dropdown list a value between 1 (= no importance) and 5 (=absolutely relevant)*	**How frequent is this BARRIER/ENABLER across restauration actions at your pilot site?** *Please choose from the dropdown list a value between 1 (= we never have to deal with this barrier/enabler) and 5 (= we always have to deal with this barrier/enabler)*
TECHNICAL BARRIERS	Barriers from scientific literature	Limited engineering and ecological expertise (e.g. current marine infrastructure does not take biodiversity into account; preference for grey infrastructure than for NBS)		
		Lack of data and metrics for biodiversity		
		Lack of data and metrics for ecosystem services, ecological processes and functions		
		Difficulties with monitoring programs (e.g. scarce accessibility to wetlands, islands, etc.)		
		Difficulties related to management plans (e.g. plans still to be defined, lack of consensus)		
		Delayed performance of restoration projects		
		Lack of physical room for restoration (e.g. beaches too narrow to restore dune systems, presence of anthropic infrastructure/activities)		
		Acute degradation level and divergence in target state		
		Insufficient restoration pace/scale with uncertain benefits and tradeoffs		
		Poor sequencing and limited compatibility with existing infrastructure		
	Other barriers	Mismatch between protected species ecology and restoration works (e.g. interventions overlapping with bird nesting season)		
		Mismatch between socioeconomic needs and restoration works (e.g. interventions overlapping with bathing season)		
		Physical context specific of the site (e.g. terrain typology, watershed, hydrological context, sand availability...)		
	Further barriers			
		Please, enter missing BARRIERS in this grey rows (15-19) of column C (as much as required) to complete the list for your pilot		
TECHNICAL ENABLERS	Enablers from scientific literature	Advanced forecasting models that support connectivity restoration (e.g. sediment transport modeling)		
		Implementation and planning with a safe operating physical space (i.e. safety from flooding, erosion, etc.)		
		Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)		
		Proactive maintenance with performance indicators		
	Other enablers	Willingness to promote restoration among stakeholders		
	Further enablers			
		Please, enter missing ENABLERS in this grey rows (25-29) of column C (as much as required) to complete the list for your pilot		

			How relevant is this BARRIER/ENABLER at your pilot site? *Please choose from the dropdown list a value between 1 (= no importance) and 5 (=absolutely relevant)*	**How frequent is this BARRIER/ENABLER across restauration actions at your pilot site?** *Please choose from the dropdown list a value between 1 (= we never have to deal with this barrier/enabler) and 5 (= we always have to deal with this barrier/enabler)*
GOVERNANCE BARRIERS	Barriers from scientific literature	Lack of integrated approach (i.e. interdisciplinary and coordinated action among stakeholders)		
		Limitations in coordinated decision making		
		Lack of social engagement in restoration activities		
		Negative social perception and pervasive inertia (i.e. passive actitude of institutions and other stakeholders)		
		Focus in short term policies		
		Lack of covergence in stakeholders' interests		
		Lack of laws and policies engaging conservation, management and restoration of natural environments		
		Bureaucratic issues or delays in authorising the work or receiving work permits		
		Dealing with socioeconomic needs		
	Further barriers			
		Please, enter missing BARRIERS in this grey rows (11-15) of column C (as much as required) to complete the list for your pilot		
GOVERNANCE ENABLERS	Enablers from scientific literature	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)		
		Explicit accounting of coastal natural capital (biodiversity and ecosystem services)		
		New policies towards decarbonised coastal protection (e.g. NBS vs. Grey infrastructure)		
		New plans for transition in governance (promoting participation and sharing the benefits)		
		Continued training for deeper stakeholder involvement		
	Further enablers			
		Please, enter missing ENABLERS in this grey rows (21-25) of column C (as much as required) to complete the list for your pilot		

			How relevant is this BARRIER/ENABLER at your pilot site? *Please choose from the dropdown list a value between 1 (= no importance) and 5 (=absolutely relevant)*	**How frequent is this BARRIER/ENABLER across restauration actions at your pilot site?** *Please choose from the dropdown list a value between 1 (= we never have to deal with this barrier/enabler) and 5 (= we always have to deal with this barrier/enabler)*
FINANCIAL BARRIERS	Barriers from scientific literature	Lack of economic resources to invest in restoration actions		
		Low benefit-cost ratios (or a lack of cost-benefit evaluation)		
		Low SHORT-TERM returns from investments		
		Short term and small scale bias		
		Business plans bound to local constraints		
		Lack of long term economic support		
	Further barriers			
		Please, enter missing BARRIERS in this grey rows (8-12) of column C (as much as required) to complete the list for your pilot		
FINANCIAL ENABLERS	Enablers from scientific literature	Increasing restoration funding		
		Innovative value-capture instruments and business models		
		Improved capacity to develop business models and bankable plans		
	Further enablers			
		Please, enter missing ENABLERS in this grey rows (16-20) of column C (as much as required) to complete the list for your pilot		

			TECHNICAL BARRIERS																	
			Barriers from scientific literature											Other barriers			Further barriers			
		Please indicate which are, according to your expert's criterion, the technical BARRIERS that connect with any governance or financial BARRIERS. *You can choose an answer from the dropdown list available in any cell from the TWO possibilities:* ***1_Weak: Occasional connection*** ***2_Strong: Frequent connection*** *In case no connections are recognized between two barriers, do not select any answers.*	Limited engineering and ecological expertise (e.g. current marine infrastructure does not take biodiversity	Lack of data and metrics for biodiversity	Lack of data and metrics for ecosystem services, ecological processes and functions	Difficulties with monitoring programs (e.g. scarce accessibility to wetlands, islands, etc.)	Difficulties related to management plans (e.g. plans still to be defined, lack of consensus)	Delayed performance of restoration projects	Lack of physical room for restoration (e.g. beaches too narrow to restore dune systems, presence of anthropic	Acute degradation level and divergence in target state	Insufficient restoration pace/scale with uncertain benefits and tradeoffs	Poor sequencing and limited compatibility with existing infrastructure	Mismatch between protected species ecology and restoration works (e.g. interventions overlapping with bird	Mismatch between socioeconomic needs and restoration works (e.g. interventions overlapping with bathing season)	Physical context specific of the site (e.g. terrain typology, water shed, hydrological context, sand availability…)	Please, enter AGAIN here the missing BARRIERS in this grey rows to complete the list for your pilot				
GOVERNANCE BARRIERS	Barriers from scientific literature	Lack of integrated approach (i.e. interdisciplinary and coordinated action among stakeholders)																		
		Limitations in coordinated decision making																		
		Lack of social engagement in restoration activities																		
		Negative social perception and pervasive inertia (i.e. passive actitude of institutions and other stakeholders)																		
		Focus in short term policies																		
		Lack of covergence in stakeholders' interests																		
		Lack of laws and policies engaging conservation, management and restoration of natural environments																		
		Bureaucratic issues or delays in authorising the work or receiving work permits																		
		Dealing with socioeconomic needs																		
	Further barriers	Please, enter AGAIN here the missing BARRIERS in this grey rows to complete the list for your pilot																		
FINANCIAL BARRIERS	Barriers from scientific literature	Lack of economic resources to invest in restoration actions																		
		Low benefit-cost ratios (or a lack of cost-benefit evaluation)																		
		Low SHORT-TERM returns from investments																		
		Short term and small scale bias																		
		Business plans bound to local constraints																		
		Lack of long term economic support																		
	Further barriers	Please, enter AGAIN here the missing BARRIERS in this grey rows to complete the list for your pilot																		

			TECHNICAL ENABLERS																	
			Enablers from scientific literature				Other enablers	Further enablers												
		Please indicate which are, according to your expert's criterion, the technical ENABLERS that connect with any governance or financial ENABLERS. *You can choose an answer from the dropdown list available in any cell from the TWO possibilities:* ***1_Weak: Occasional connection*** ***2_Strong: Frequent connection*** *In case no connections are recognized between two enablers, do not select any answers.*	Advanced forecasting models that support connectivity restoration (e.g. sediment transport modeling)	Implementation and planning with a safe operating physical space (i.e. safety from flooding, erosion, etc.)	Increased pace of restoration upscaling (to keep up with socioeconomic and climatic conditions)	Proactive maintenance with performance indicators	Willingness to promote restoration among stakeholders	Please, enter AGAIN here the missing ENABLERS in this grey rows to complete the list for your pilot											
GOVERNANCE ENABLERS	Enablers from scientific literature	There are multi-level governance mechanisms (planification at a local level must contribute to national and international regulation)																		
		Explicit accounting of coastal natural capital (biodiversity and ecosystem services)																		
		New policies towards decarbonised coastal protection (e.g. NBS vs. Grey infrastructure)																		
		New plans for transition in governance (promoting participation and sharing the benefits)																		
		Continued training for deeper stakeholder involvement																		
	Further enablers	Please, enter AGAIN here the missing ENABLERS in this grey rows to complete the list for your pilot																		
FINANCIAL ENABLERS	Enablers from scientific literature	Increasing restoration funding																		
		Innovative value-capture instruments and business models																		
		Improved capacity to develop business models and ba																		
	Further enablers	Please, enter AGAIN here the missing ENABLERS in this grey rows to complete the list for your pilot																		

B. Template document to provide qualitative information on the particularities of each Pilot case and the context-specific information about barriers and enablers in each Pilot region

Technical report on barriers (D 1.2) info collector from pilots

Please, provide the following information and return this document to Albirem & Eurecat teams (lpuertolas@albirem.com and ferran.bertomeu@eurecat.org). This information will be used to complete deliverable D1.2 *Technical report on barriers and enablers for coastal restoration upscaling: A multi-level perspective* along with the information introduced in the Excel sheet and your CORE-PLAT key stakeholders' inputs in the Google form.

GENERAL INFO

1.-Please, name your pilot

2.-Is there any territorial or regional casuistic that we should be aware at analyzing the context of barriers and enablers in your pilot case?

We would like you to share any updated information as a complement to the preliminary questionnaire sent by Ivan Cáceres from UPC to the pilots last March 2022.

APPROACHING BARRIERS AND ENABLERS

3.-In your opinion, which is the main BARRIER category to coastal restoration (Technical, Governance or Financial)? Why?

4.-In general, do you feel that BARRIERS have been a relevant factor that has hampered coastal restoration efforts in the past in your pilot area? Why?

5.-Also, do you feel that ENABLERS have been a relevant factor that has boosted coastal restoration efforts in the past in your pilot area? Why?

EXPLORING KEY FACTS ABOUT BARRIERS AND ENABLERS

6.-In general, which role may TECHNICAL BARRIERS play to restoration upscaling in your CORE-PLAT?

We would like you to elaborate a bit about this, to summarize the detailed information that you might have provided in sheet number 2 of the Excel file "2_Technical_BE".

7.-In general, which role may TECHNICAL ENABLERS play to restoration upscaling challenges in your CORE-PLAT?

We would like you to elaborate a bit about this, to summarize the detailed information that you might have provided in sheet number 2 of the Excel file "2_Technical_BE".

8.-Do you want to add something about GOVERNANCE or FINANCIAL BARRIERS/ENABLERS as a complement to the info in the excel sheet?

We would like you to elaborate a bit about this, to summarize the detailed information that you might have provided in sheet number 3 and 4 of the Excel file "3_Governance_BE" and "4_Financial_BE".

9.-In your opinion, how does the framework on barriers and enablers from the reference paper in D1.2. (Sánchez-Arcilla et al. 2022) match with the casuistic in your area/CORE-PLAT?

E.g. Do you feel the framework works in general to explain barriers and enablers in your pilot case? Have you perceived relevant singularities in your area that were not in the paper?

10.-Have you perceived synergies between different BARRIERS and ENABLERS in your area that you would like to elaborate in broad sense?

E.g. You diagnose that your pilot often struggles with the technical barrier "Delayed performance of restoration projects" and its link with the financial barrier "Lack of economic resources to invest in restoration actions". Would like to discuss about this?

KEY STAKEHOLDERS IN THE GOOGLE FORM

(SECTION TO BE ANSWERED ONCE YOU RECIEVE THE EURECAT AND ALBIREM' FEEDBACK FROM THE GOOGLE FORM SENT TO STAKEHOLDERS)

11.-How do you contextualize the response of the stakeholders which have answered the Google Form in your pilot case?

E.g: Are the organisations- that have answered the questionnaire- the most representative ones? Are the ones you expected to answer? Are they having any casuistic that you would like us to be aware of?

12.-Other relevant information.

Please indicate here any information that might be taken into account about the barriers/enablers to upscale coastal restoration in your pilot area.