



# Guidelines on how to operate the methods explorer in ORs and OCT

Deliverable n° D.2.3

July 2022

**Citation:** MOVE-ON project (2022), European Commission Directorate General Environment Grant Agreement no. 07.027735/2019/808239/SUB/ENV.D2. Deliverable n° D.2.3 - Guidelines on how to operate the methods explorer in ORs and OCT.

Coordinated by:



Partners:



UNIVERSITY OF TRENTO



Supported by:



This project has received funding from the European Union represented by European Commission Directorate General Environment under grant agreement N° 07.027735/2019/SI2.808239/SUB/ENV.D2. This document only reflects the views of its authors. The Commission is not responsible for any use that may be made of the information it contains.

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|-----------------------------|--|
| <b>Project Acronym</b>      | <b>MOVE-ON</b>   |
| <b>Project Title</b>        | <b>From case studies to anchor projects - setting the ground to advance MAES in Europe's overseas.</b> |
| <b>Grant Agreement n°</b>   | 07.027735/2019/808239/SUB/ENV.D2   |
| <b>Start of the project</b> | May 2020   |
| <b>Duration</b>             | 36 months  |
| <b>Project coordinator</b>  | Regional Fund for Science and Technology, Regional Government of the Azores (Portugal)                 |
| <b>Website</b>              | <a href="http://www.moveon-project.eu">www.moveon-project.eu</a>                                       |

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|--------------------------------|---|
| <b>Deliverable title</b>       | Guidelines on how to operate the methods explorer in ORs and OCT  |
| <b>Deliverable n°</b>          | D.2.3   |
| <b>Activity title</b>          | Activity 2 - Method development and implementation support  |
| <b>Task title</b>              | Task 2.3 Developing a methods explorer for ecosystems conditions and ecosystem services that will be most applicable for OR & OCT regions |
| <b>Task Leader(s)</b>          | URJC/LUH  |
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| <b>Due date of deliverable</b> | 31/12/2020  |
| <b>Actual submission date</b>  | 15/07/2022  |
| <b>Dissemination Level:</b>    | Internal  |

| <b>Version</b> | <b>Status</b>         | <b>Date</b> | <b>Author(s)</b>   |
|----------------|-----------------------|-------------|--|
| <b>1.0</b>     | 1 <sup>st</sup> Draft | 28/06/2021  | Montero-Hidalgo, M; Santos-Martín, F., Sieber, I.M.; Burkhard, B. Rendon, P. |
| <b>1.2</b>     | 2 <sup>nd</sup> Draft | 05/07/2021  | Rendon, P  |
| <b>1.3</b>     | Final version         | 28/06/2022  | Montero-Hidalgo, M   |

## Summary

This report provides guidelines on how to operate the MAES Methods Explorer created under the ESMERALDA EU Project and updated under the MOVE and MOVE-ON project. The **MAES Methods explorer** is part of the **ESMERALDA MAES navigator**. This navigator provides directions by several **steps** on the process of mapping and assessment of ecosystem services. **The MAES Methods Explorer, included in the step 4** of this navigator, guides users **to select the appropriate methods for mapping and assessing ecosystems and their services**. The MAES Methods Explorer **database** incorporates the outcomes delivered by EU-funded projects such as **ESMERALDA, OpenNESS, OPERAs, MOVE**, the dedicated EU MAES Working Group, and will also include the MOVE-ON results when they are available. This guide has been elaborated **under MOVE-ON project task 2.3 *Developing a methods explorer for ecosystems conditions and ecosystem services that will be most applicable for OR & OCT regions*** led by LUH and URJC teams. The task aims to (1) update the mentioned MAES Methods Explorer with MOVE-ON outcomes and (2) adapt the explorer to be more applicable for OR & OCT regions.

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## List of abbreviations

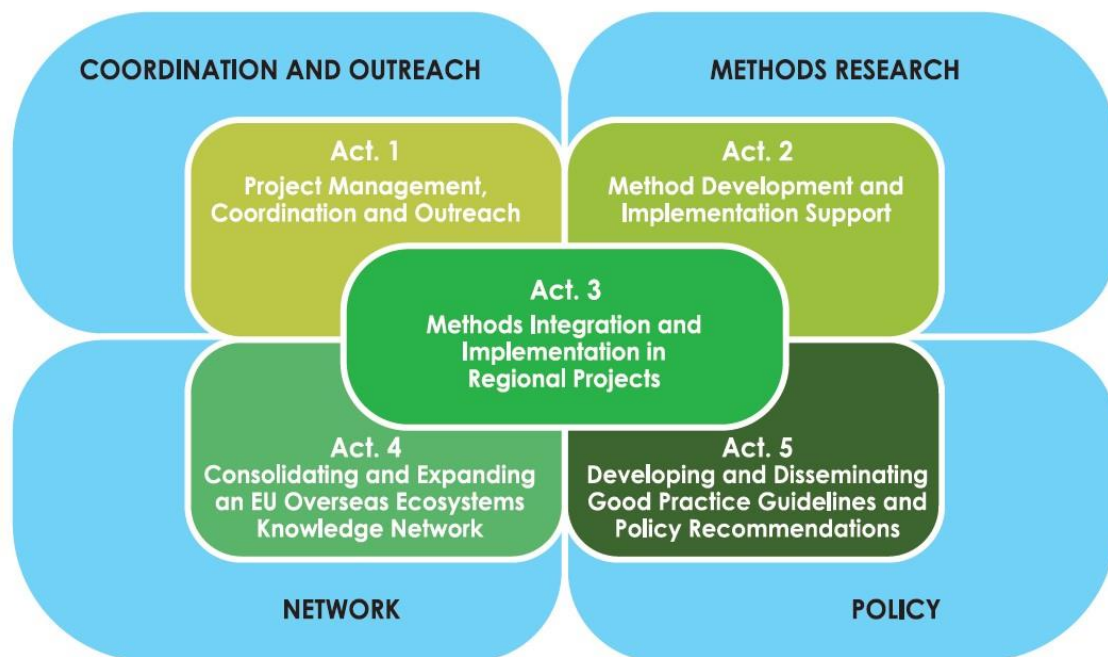
|           |  |
|-----------|--|
| BISE      | Biodiversity Information System  |
| CICES     | Common International Classification of Ecosystem Services  |
| ES        | Ecosystem Service  |
| ESMERALDA | Enhancing ecoSystem sERVICES mApping for poLicy and Decision mAKing  |
| OPENESS   | Operationalisation Of Natural Capital And Ecosystem Services   |
| OPERAs    | Operational Potential of Ecosystem Research Applications   |
| EU        | European Union   |
| IUCN      | International Union for Conservation of Nature   |
| MAES      | Mapping and Assessment of Ecosystems and their Services  |
| MOVE      | Mapping and Assessing the State of Ecosystems and their Services in the Outermost Regions and Overseas Countries and Territories: Establishing links and pooling resources   |
| MOVE-ON   | Mapping and Assessing the State of Ecosystems and their Services in the Outermost Regions and Overseas Countries and Territories: From Case Studies to Anchor Projects - Setting the ground to advance MAES in Europe´s overseas |
| (M)PA     | (Marine) Protected Area  |
| OCT       | Overseas Countries and Territories   |
| OR        | Outermost Region   |

## 1. INTRODUCTION

Action 5 of the 2nd target of the European Union's (EU) 2020 Biodiversity Strategy urged EU Member States to map and assess the state of ecosystems and their services (MAES) in their national territory (European Commission, 2011). Biodiversity, ecosystems and their services remain central in the EU Biodiversity Strategy for 2030, with even more ambitious targets (European Commission, 2020). Europe's Outermost Regions (ORs) and Overseas Countries and Territories (OCTs) are spread all around the globe and have exceptionally high biodiversity and multiple related values. These territories host more than 70% of all EU biodiversity and include 20% of the world's coral reefs and lagoons (Petit and Prudent 2008). They encompass the most diverse ecosystems on often very small scales, from coral reefs and mangroves, tropical rainforests, mountain ecosystems to polar - and subpolar seas, which provide multiple relevant ecosystem services from a local to global scale (Petit and Prudent 2008).

The MOVE pilot project (GA. No.07.027735/2018/776517/SUB/ENV.D2) intended to facilitate MAES and support regional policies in the EU ORs and OCTs. The work developed highlighted the steps forward in implementing MAES in these territories and the need to progress with MAES.

The MOVE-ON pilot project *"From case studies to anchor projects setting the ground to advance MAES in Europe's overseas"* aims to advance MAES and related methodologies' implementation in European ORs and OCTs. See the structure of the project in **Figure 1**.



**Figure 1.** MOVE-ON project structure.

The project intends to create and strengthen the scientific and technical MAES communities in the territories, taking a bottom-up approach that has been initiated in the MOVE project (2019 – 2021) and demonstrated the benefits of assessments of ecosystems, their conditions, and services to support decision-making. The goal of MOVE-ON is to contribute to local, EU and international policies and goals. At the same time, MOVE-ON aims to develop good practice guidelines and policy recommendations for improving the health status of ecosystems tailored for overseas regions' specificities and needs, pooling resources while involving and empowering local actors. It complements and expands the activities of the MOVE project, strengthening links with the ongoing work to further test and implement MAES in different regions underpinned by four Anchor Projects in French Guiana, Macaronesia, Reunion Island and South Atlantic.

## 1.1 . Overview of MOVE-ON Activity 2 “Method development and implementation support”

The general objectives of the MOVE-ON Activity 2 are:

- i. To **identify, develop and support the implementation of suitable methods of ecosystem assessment and ecosystem services** considering specific needs and data availability.
- ii. And define fundamental **baseline ecological reference data for ecosystem services assessment** in a context of climate change and anthropogenic pressures (e.g. selected major marine coastal ecosystems in overseas EU)

The activity is carried out by considering existing data and knowledge and gathering information on the needs and expectations of the relevant stakeholders in the ORs and OCTs. A range of different approaches for mapping and assessing ES are considered (e.g. cross-disciplinary integration of biophysical, social, and economic mapping and assessment approaches). These methods take into account different levels of detail and complexity through a tiered approach that can be applied according to the purpose of the respective ES study, data and resources availability, and specific needs. The work exploits expert- and land cover- based methods, existing ES indicator data and more complex process-based ES models. Such tiered solutions will allow the Anchor Projects (to be implemented in Activity 3) to work with different levels of available information (or poor information availability in case of data absence), and in diverse contexts. In addition, an innovative tool such as an online method explorer (the ESMERALDA MAES Methods Explorer) will be used, updated with MOVE-ON outcomes, and adapted to be more applicable for OR & OCT regions during MOVE-ON project.

In general, the aim of Activity 2 is to jointly develop and test these methods and tools resulting from the applications provided by the Anchor Project partners, which include relevant experts, networks and stakeholders from across the overseas territories.

Specifically, the objectives of task 2.3 *Developing a methods explorer for ecosystems conditions and ecosystem services that will be most applicable for OR & OCT regions* led by LUH and URJC team, are to (1) update the mentioned MAES Methods Explorer created under the ESMERALDA EU Projects, and (2) adapting it to be more applicable for OR & OCT regions. The MAES Methods Explorer database incorporates the outcomes delivered by EU-funded projects such as ESMERALDA, OpenNESS, OPERAs, MOVE, and the dedicated EU MAES Working Group. One of the purposes of this task is to add the MOVE-ON outcomes. The navigator includes methods from the whole MAES cycle, starting from ecosystem type and condition mapping, ecosystem services mapping and national capital/ecosystem accounting.

## 2. MAES Methods Explorer description and guidelines to operate it.

The **MAES Methods explorer** is included in the **ESMERALDA MAES navigator** created by ESMERALDA EU Project<sup>1</sup>. This navigator provides directions by several **steps** on the process of mapping and assessment of ecosystem services, and offers examples from different projects such as ESMERALDA, OpenNESS, OPERAs, and the dedicated EU MAES Working Group. Between 2020 and 2022, the MOVE outcomes were also included in the MAES Methods Explorer database and at the end of 2021, two new buttons were created to give access to the MOVE and MOVE-ON websites repositories in the step 5 of the ESMERALDA MAES navigator “Mapping & assessment case study applications” (**Figure 14**). Currently, the MOVE-ON case studies results are still on-going and pending to load.

On the other hand, the MAES Methods Explorer, **included in step 4** of this navigator, guide users to select **the appropriate methods** for mapping and assessing ecosystems and their services. In 2020, the MAES Methods explorer database was updated during the MOVE project with **75 publications** carried out in the EU Overseas in which 157 different methods were used. For this, a special category called “outer regions” was added based on the literature review of Sieber et al., (2018). Between 2021 and 2022, this database was updated again with **40 studies more**, employing the same search protocol used previously (Sieber et al., 2018).

Additionally, the label “Outer region” was exchanged for “EU Overseas” as well as six new and more specific categories were added. These are: **British Overseas Territories, French Overseas Territories, French Southern Territories, Netherlands Overseas Territories, Portuguese Outermost Regions and Spanish Outermost Regions**. Both, new publications added and old ones were then sorted into these six categories(**Figure 2**).

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<sup>1</sup> <http://esmeralda-project.eu/>

## Inside the database...

The figure consists of three screenshots of the MAES Methods Explorer database interface, illustrating the search process for EU overseas territories.

**1. Select "Country"**: The first screenshot shows the search filters section with the 'Country' dropdown menu open. A yellow arrow points to the 'Country' filter, and a green box highlights the text '1. Select "Country"'. The dropdown menu lists various countries and territories, with 'EU Overseas' highlighted.

**2. "Outer region" was exchanged for "EU Overseas"**: The second screenshot shows the search filters section with the 'Country' dropdown menu open. A yellow arrow points to the 'EU Overseas' option, and a green box highlights the text '2. "Outer region" was exchanged for "EU Overseas"'. The search results section shows 44 items found.

**3. Publications were classified by 6 EU overseas territories.**: The third screenshot shows the search filters section with the 'Country' dropdown menu open. A yellow arrow points to the 'EU Overseas' option, and a green box highlights the text '3. Publications were classified by 6 EU overseas territories.'. The search results section shows 103 items found.

Figure 2. Last update of MAES Methods Explorer database.

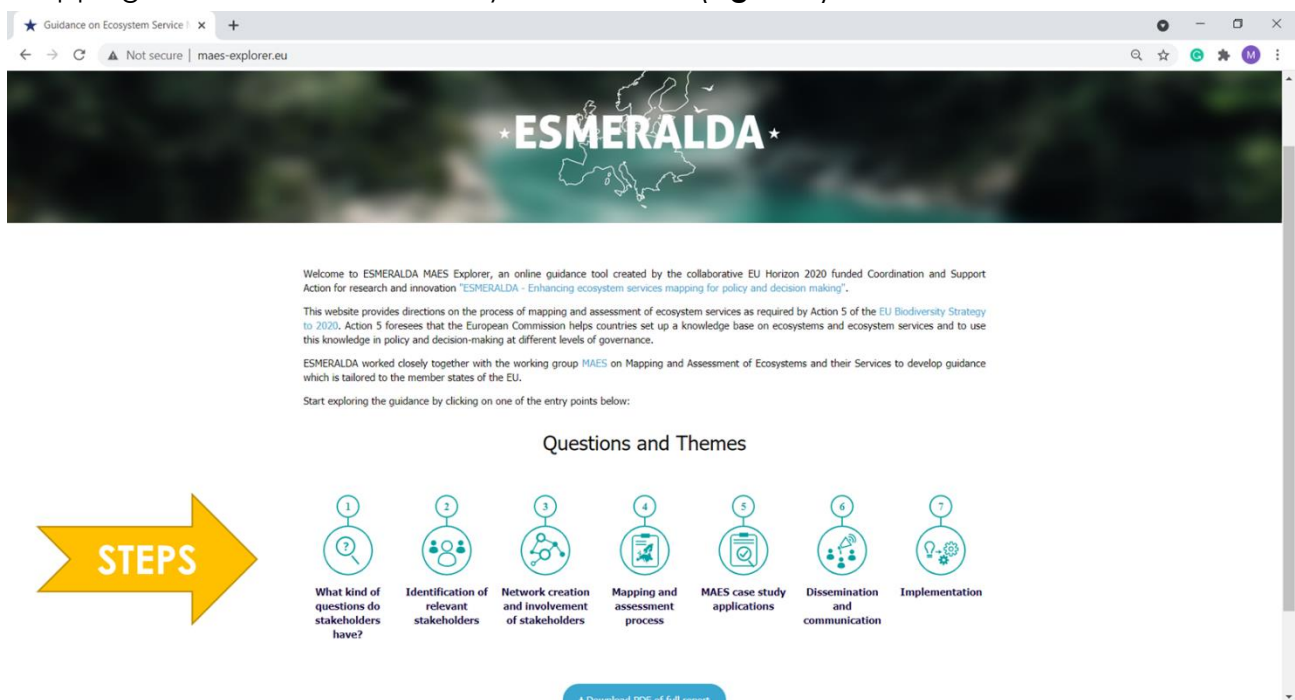
In conclusion, the MAES navigator centralizes resources and outcomes obtained in other projects beyond ESMERALDA which encourages the accessibility and promotion of these studies in a common database.

Concretly, this report is going to focus on providing guidelines on how to operate step by step these useful tools: the ESMERALDA MAES navigator and the MAES Methods Explorer.

## 2.1 How to enter?

There are two ways to enter to the **ESMERALDA MAES navigator**: (i) by this link <http://www.maes-explorer.eu/> or (ii) typing “MAES explorer” in Google navigator.

The welcome page introduces its purpose and shows seven steps to guide the process of mapping and assessment of ecosystem services (**Figure 3**).

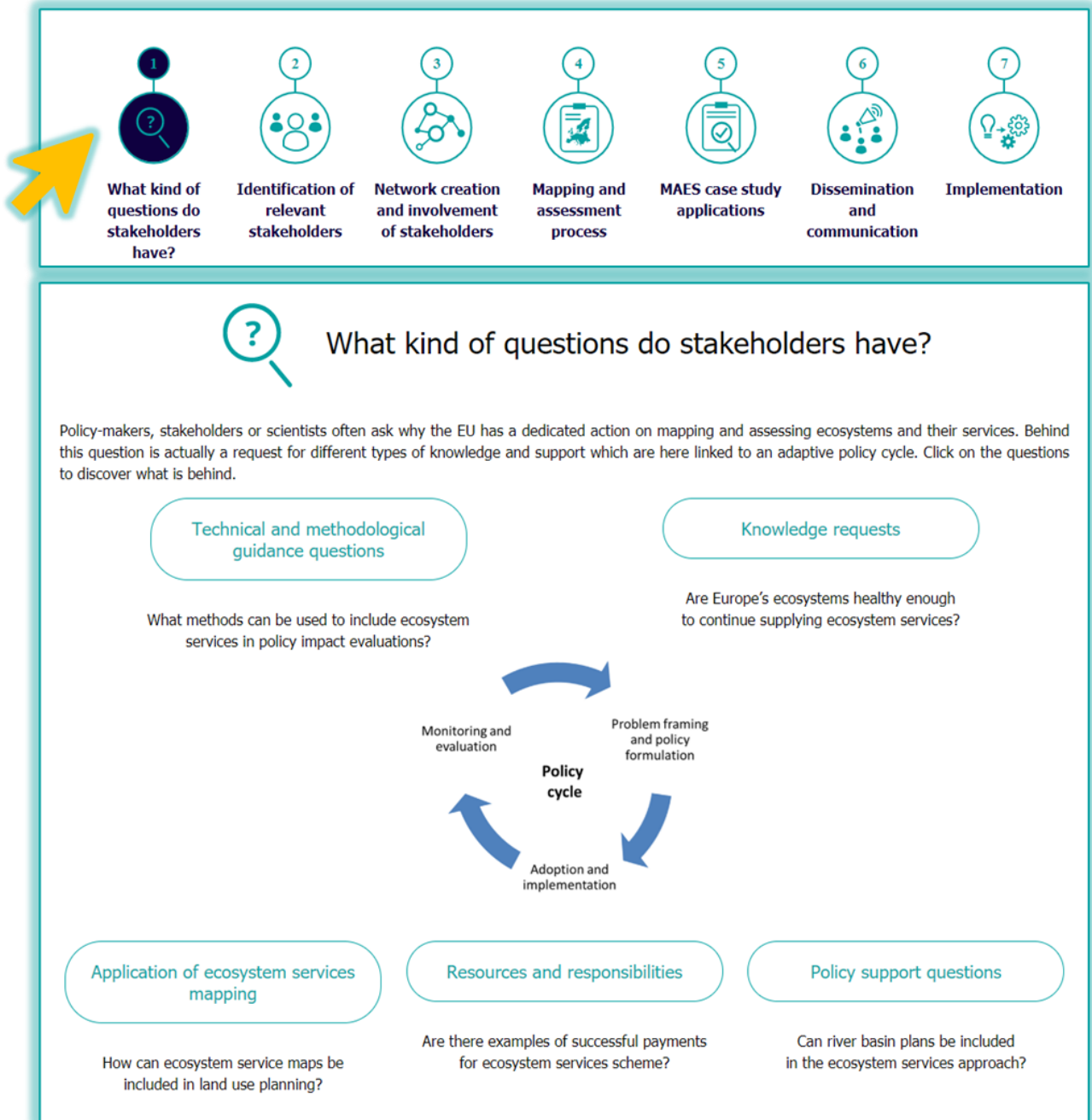


**Figure 3.**The MAES Explorer welcome page.

## 2.2 Contents of each step.

### a. Step 1. What kind of questions do stakeholders have?

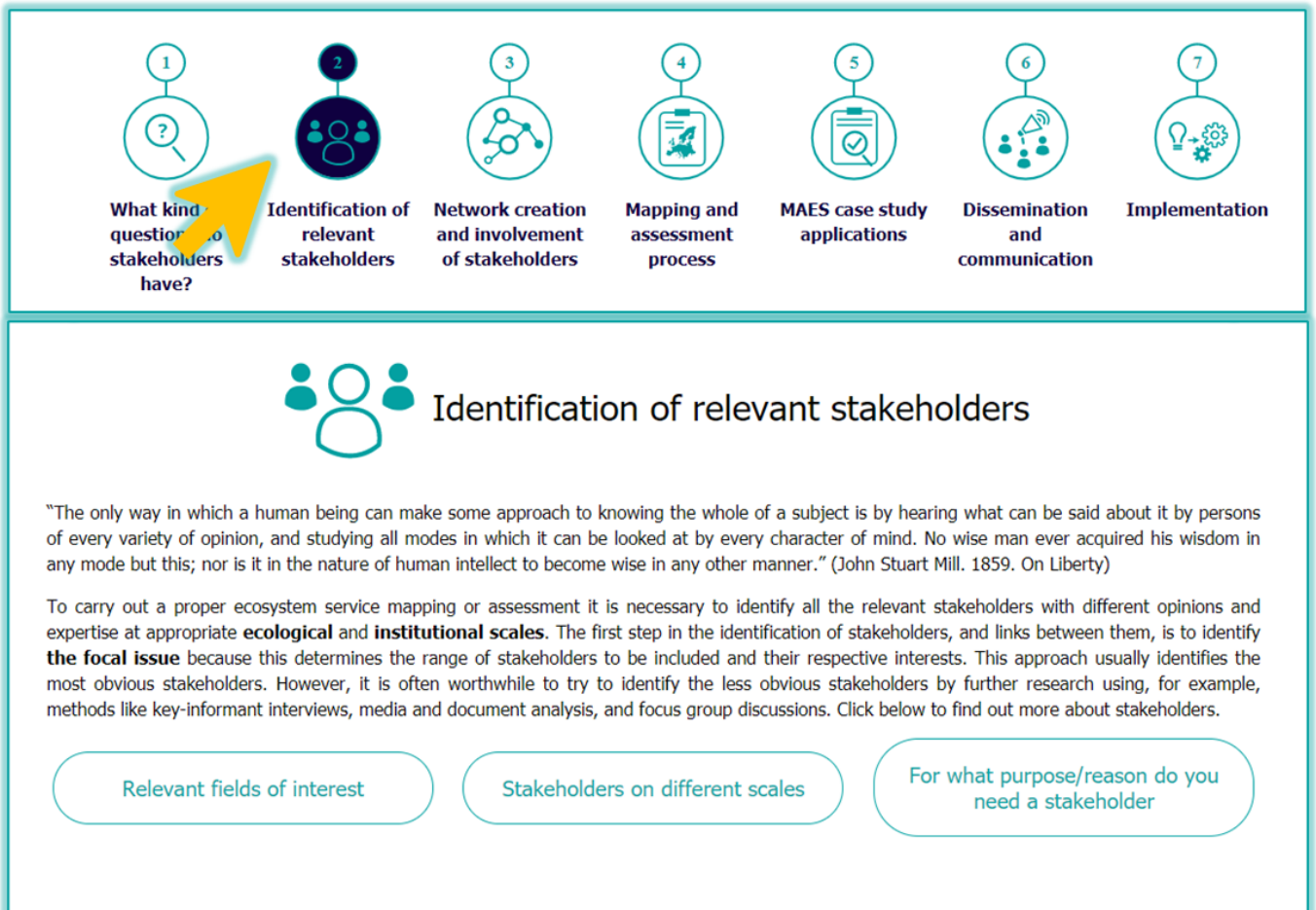
This section shows the initial questions that arise when a region wants to implement the MAES process, and how to address and solve them.



**Figure 4.** Step 1: What kind of questions stakeholders have.

b. Step 2. Identification of relevant stakeholders.

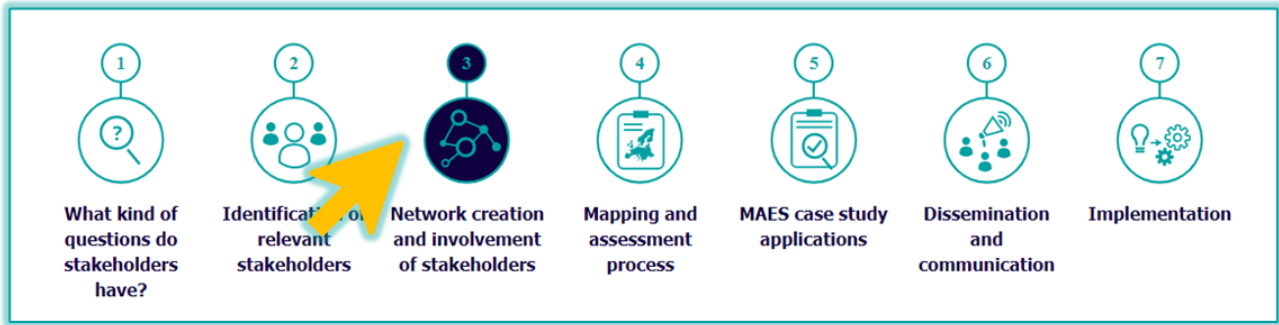
This step shows valuable information on how to address the identification of relevant stakeholders, and for what reasons researchers or practitioners need a stakeholder (**Figure 5**). The identification can be supported thanks to several stakeholders' classifications, as by the stakeholders' fields of interest or by their ecological or institutional scale. All these inputs are relevant when considering who the right stakeholders are when mapping and assessing ecosystems and their services.



**Figure 5.** Step 2: Identification of relevant stakeholders

c. Step 3. Network creation and involvement of stakeholders.

In this section, users can find existing networks in their countries, create a network (through the [Ecosystem Services Partnership](#), for instance) or find solutions to enhance the successful uptake of MAES.



## Network creation/Involvement of stakeholders

A national or regional, active network on ecosystem services, biodiversity or natural capital formed by of scientists, policymakers and practitioners can enhance considerably the successful implementation of MAES at national and regional level. Click on the buttons to find out existing networks in your country, to create a network or to find solutions to enhance successful update of MAES.

Existing networks

Stakeholder support groups and country fact sheets

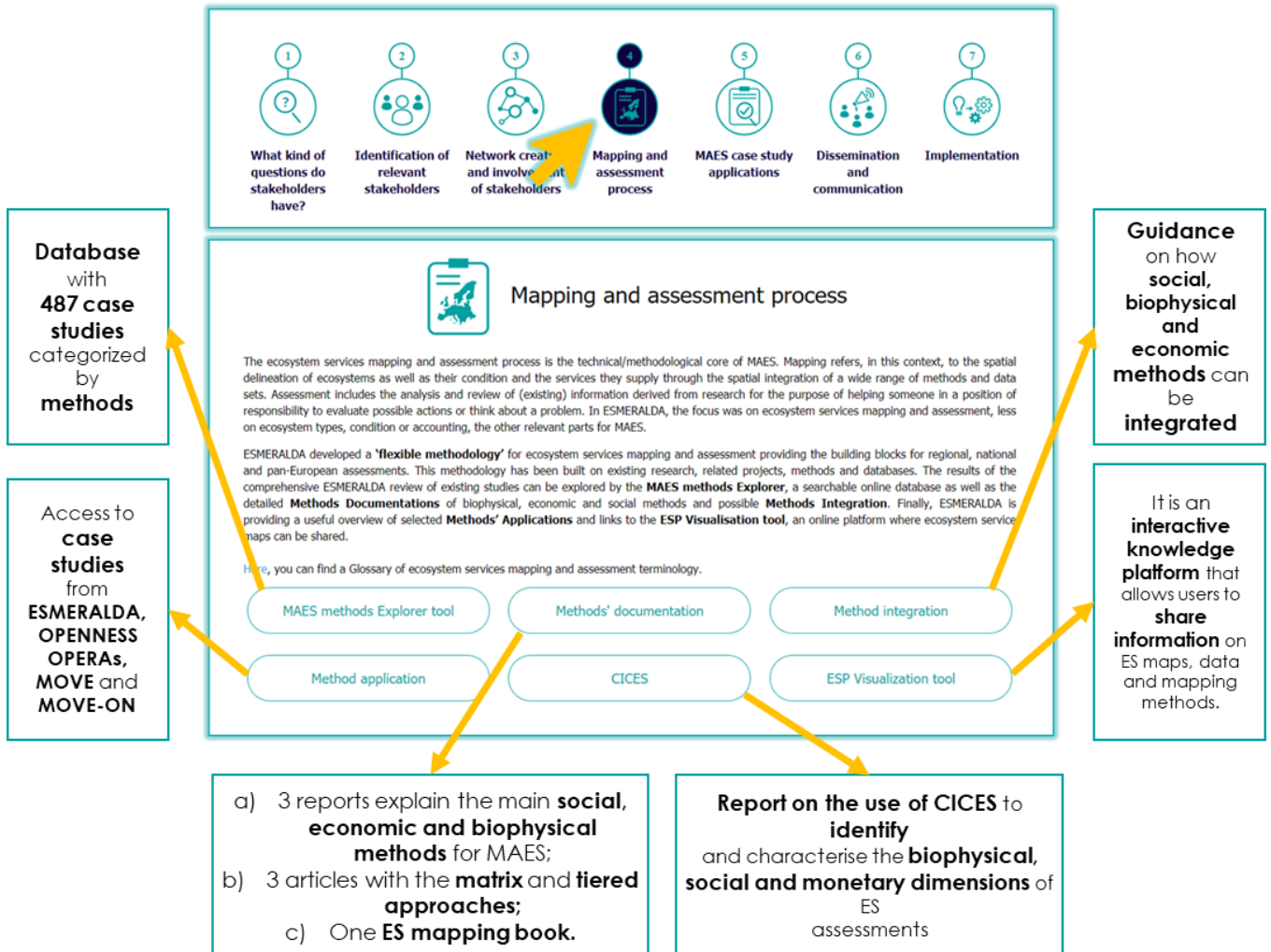
Solutions for improved uptake of MAES

Creating a network

**Figure 6.** Step 3: Network creation and involvement of stakeholders.

## d. Step 4: Mapping and assessment process

The ecosystem services mapping and assessment process is the technical/methodological **core** of MAES and contains the tool that concerns us: the MAES methods Explorer tool. Because of that, this report will describe this step in depth. Its page includes six buttons with useful information on how to address this phase (**Figure 7**).



**Figure 7.** Step 4: Mapping and assessment process

## d.1. Step 4: MAES methods Explorer tool.

After defining the purpose of the assessment, the Navigator proposes suitable methods for the particular cases. The user can further refine the results by applying filters, such as specific ecosystem services to be assessed, and broad types of methods. A list of publications and examples from practice helps to illustrate how to select the methods and tailor the assessments.

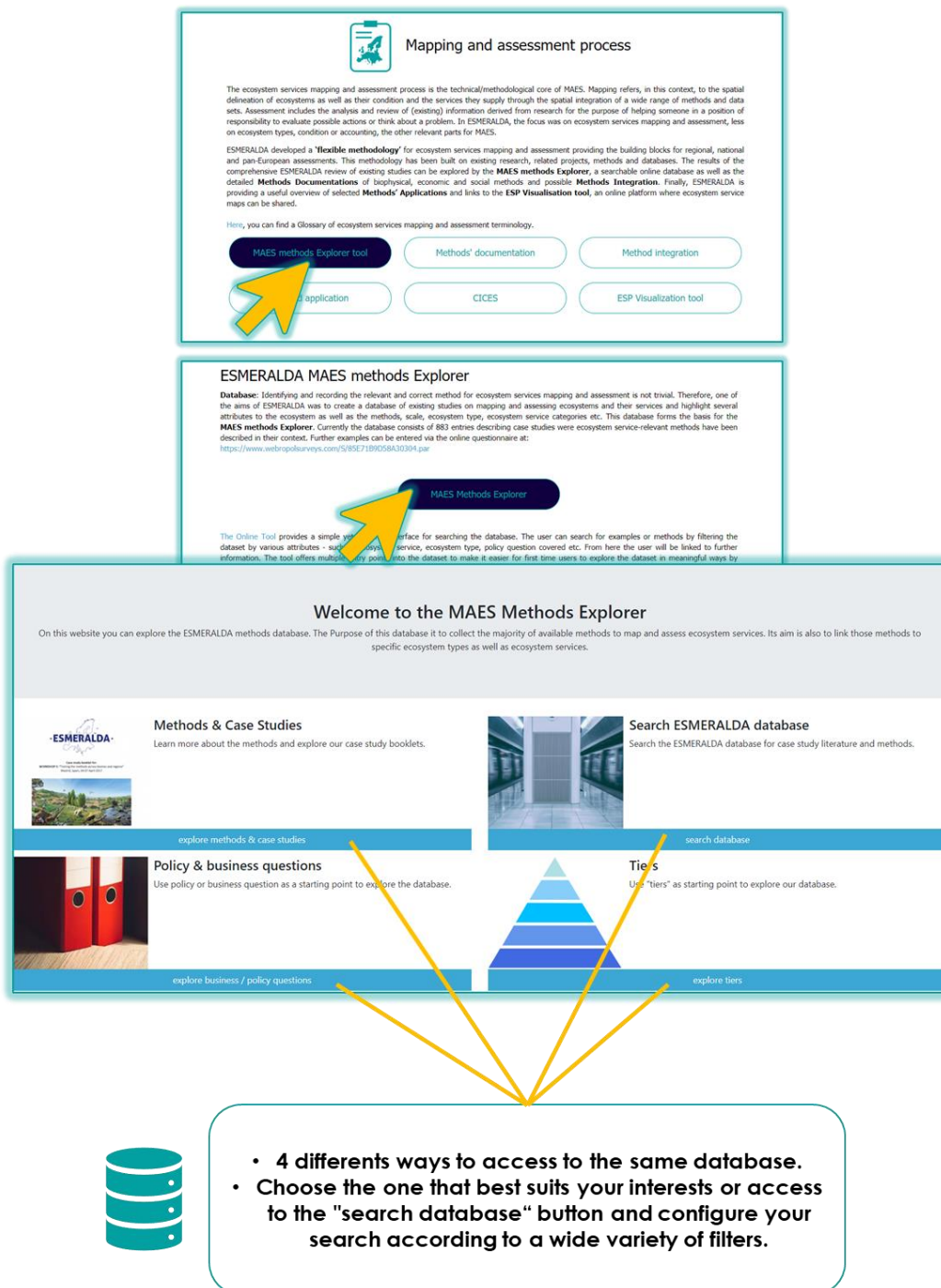


Figure 8. How to enter to MAES methods Explorer database.

## Example 1:

For instance, an anchor project focuses on identifying and evaluating **marine ecosystem services** provided in an island and the users want to use a **participatory approach**. What kind of methodologies were used to address similar case studies? The steps presented in the **Figure 9** will help to identify them and gather a useful sample to establish a start point.

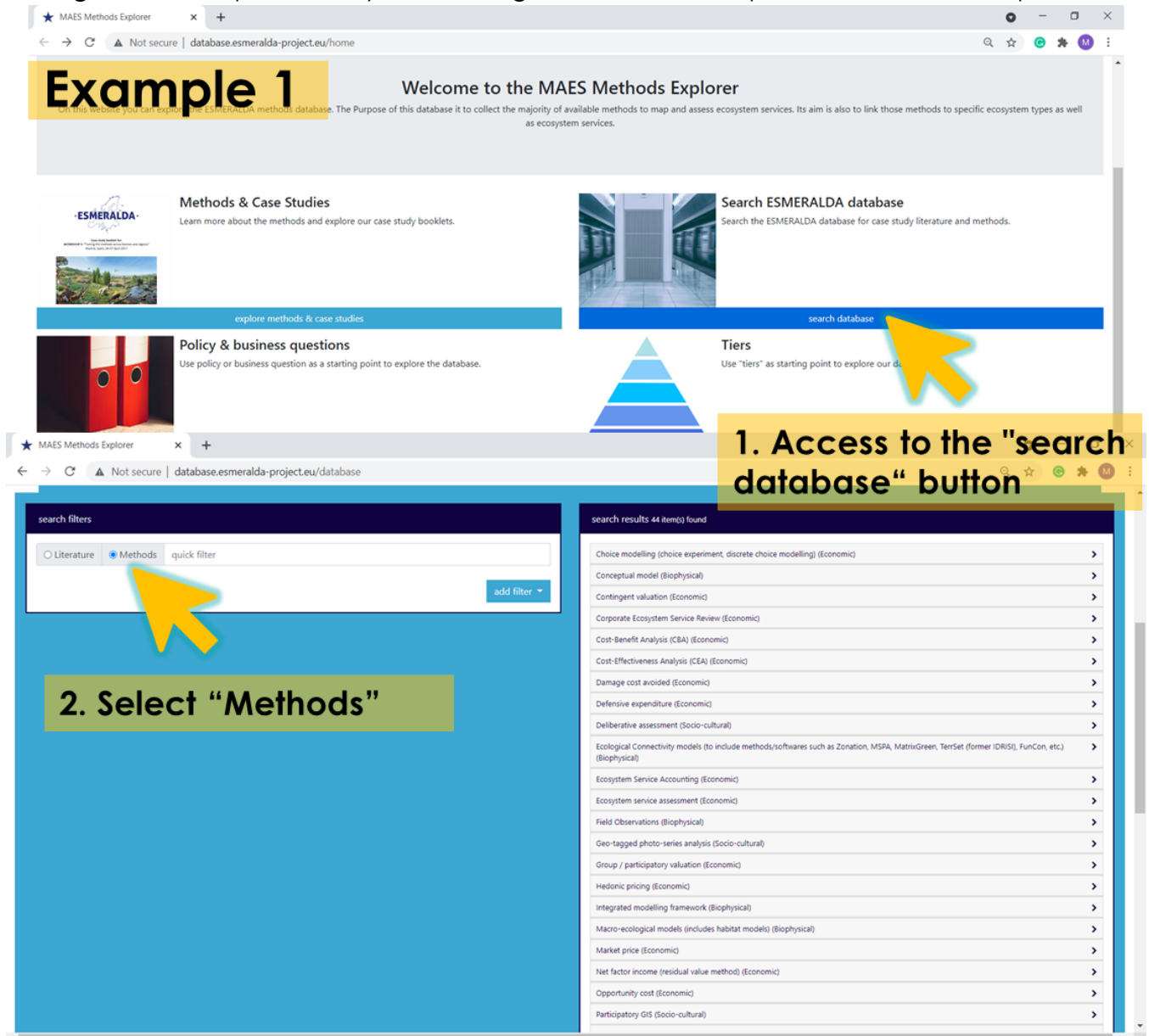


Figure 9. Example on how to operate the MAES methods explorer (I).

**3. Select "Ecosystem type"**

**4. Select "Marine inlets and transitional waters"**

**5. Drop down "Participatory GIS (Socio-cultural)"**

The screenshots show the MAES Methods Explorer interface with the following steps:

- Initial search filters and results.
- Filtering by "Ecosystem types" with a dropdown menu showing options like Coastal, Cropland, Grassland, etc.
- Filtering by "Participatory GIS (Socio-cultural)" in the search results list.

## Case studies that apply a participatory GIS in marine inlets and transitional waters ecosystems

Figure 10. Example on how to operate the MAES methods explorer (II).

## d.2. Step 4: Methods' documentation.

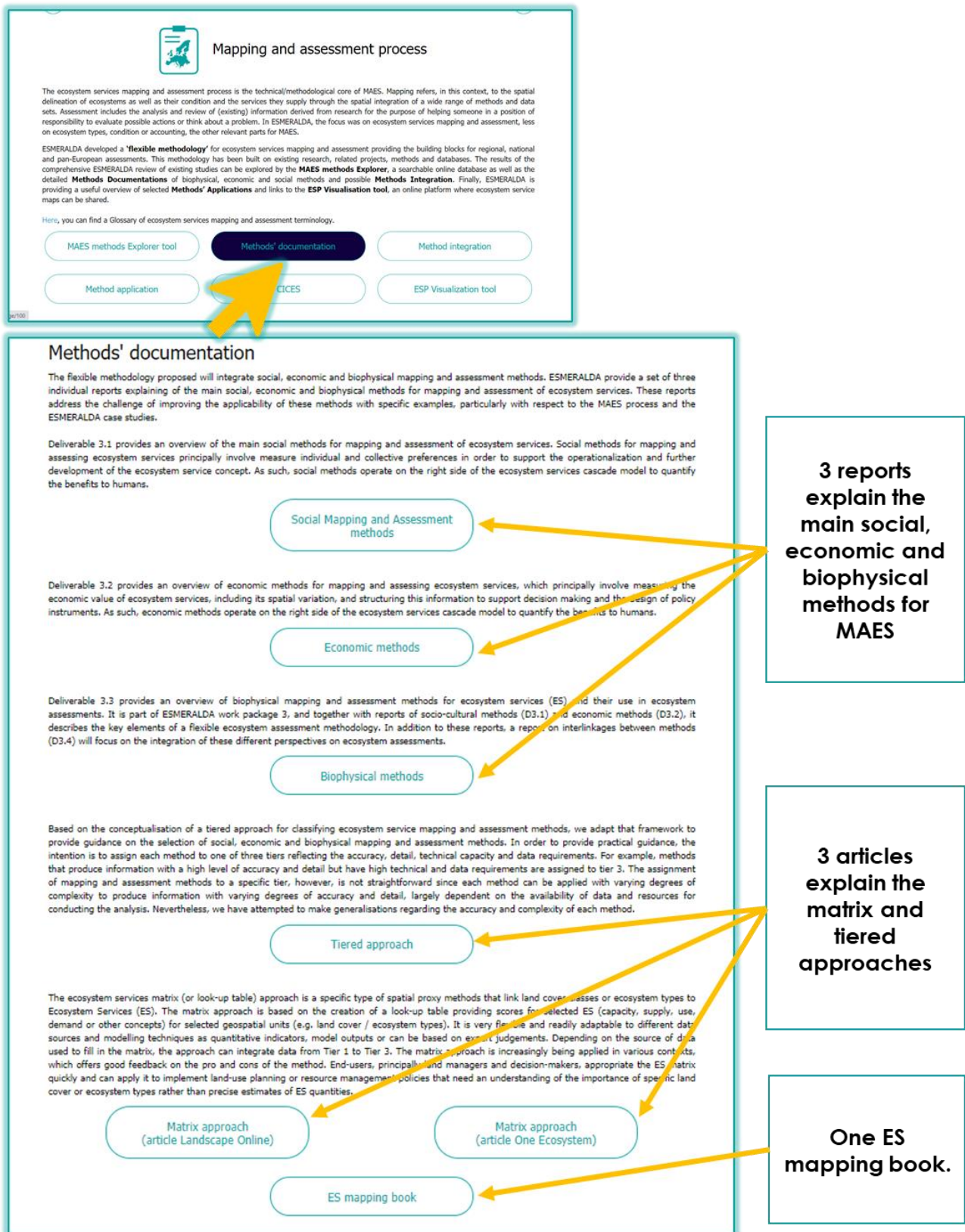


Figure 11. Step 4: Methods' documentation.

### d.3. Step 4: Method integration.

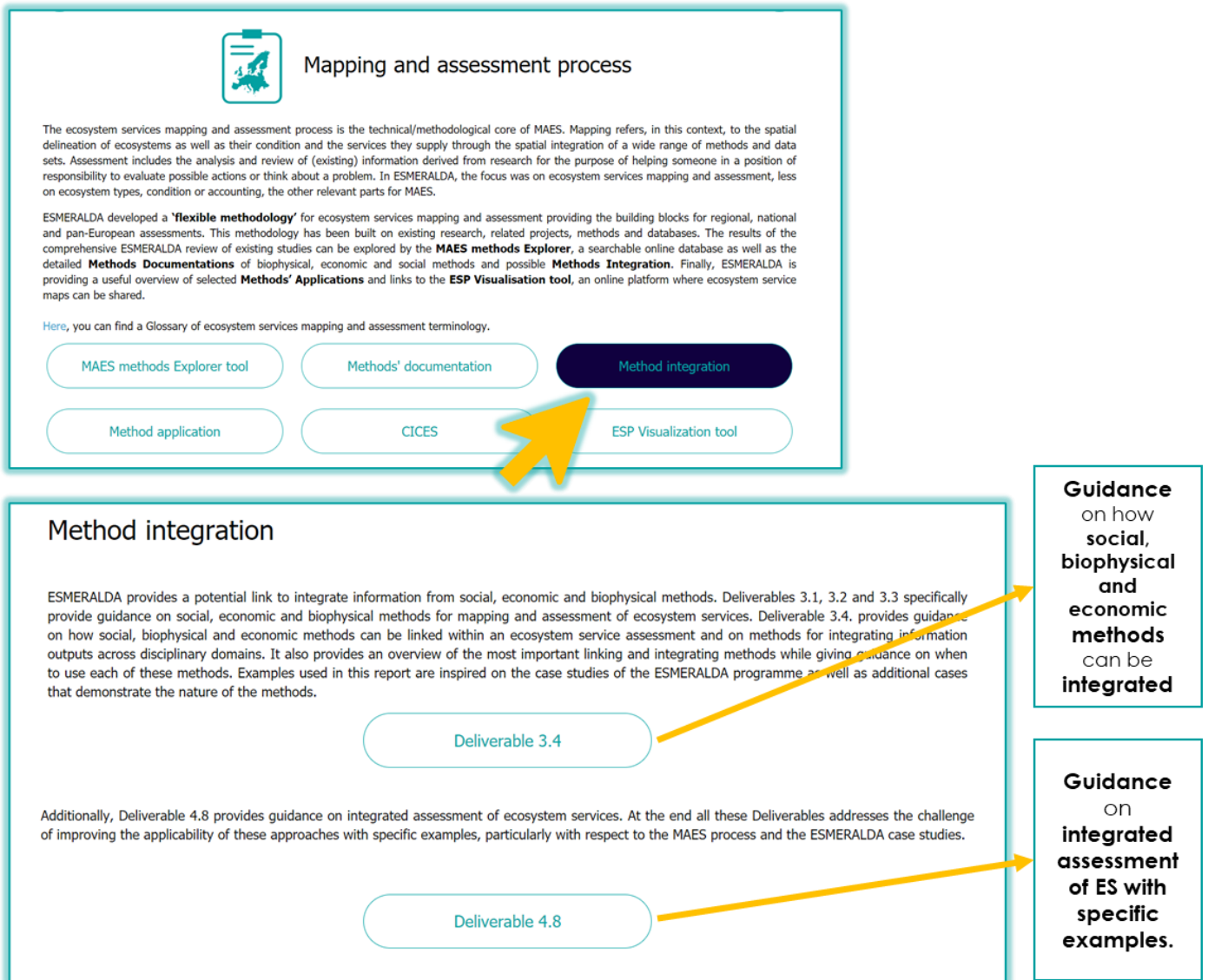


Figure 12. Step 4: Method integration

## d.4. Step 4: Method application.



### Mapping and assessment process

The ecosystem services mapping and assessment process is the technical/methodological core of MAES. Mapping refers, in this context, to the spatial delineation of ecosystems as well as their condition and the services they supply through the spatial integration of a wide range of methods and data sets. Assessment includes the analysis and review of (existing) information derived from research for the purpose of helping someone in a position of responsibility to evaluate possible actions or think about a problem. In ESMERALDA, the focus was on ecosystem services mapping and assessment, less on ecosystem types, condition or accounting, the other relevant parts for MAES.

ESMERALDA developed a **'flexible methodology'** for ecosystem services mapping and assessment providing the building blocks for regional, national and pan-European assessments. This methodology has been built on existing research, related projects, methods and databases. The results of the comprehensive ESMERALDA review of existing studies can be explored by the **MAES methods Explorer**, a searchable online database as well as the detailed **Methods Documentations** of biophysical, economic and social methods and possible **Methods Integration**. Finally, ESMERALDA is providing a useful overview of selected **Methods' Applications** and links to the **ESP Visualisation tool**, an online platform where ecosystem service maps can be shared.

Here, you can find a Glossary of ecosystem services mapping and assessment terminology.

MAES methods Explorer tool

Methods' documentation

Method integration

Method application

CICES

ESP Visualisation tool



### Mapping & assessment case study applications

The ESMERALDA case studies are working examples in which mapping and assessment of ecosystem services (ES) is applied to address specific decision problems. The selected case studies are representative of:

- the variety of existing conditions across the EU, in terms of data availability, spatial scale, levels of implementation of EU 2020 targets, and expertise and experience in ES mapping and assessment;
- the geographical regions and biomes of the entire EU, including marine areas and the outermost regions;
- the variety of cross-EU themes relevant for ecosystem services, such as agriculture, green infrastructure, natural protected areas, forestry strategy, water, business and industry sectors, and health;
- the variety of policy and planning processes that can be used to mainstream ES in real-life decisions, such as spatial and land use planning, water resource management, flooding under the EU climate adaptation action, energy policy, strategic environmental assessment, protected area planning.

Case Study Booklets (describing the process of mapping and assessment of ES) and Method Application Cards (synthesizing the main characteristic of the applied methods) illustrate the ESMERALDA case studies. The Case Study Booklets present information about the main stages of the MAES process, following the structure of the "Guidance on Ecosystem Service Mapping and Assessment" - from the identification of the policy question to the involvement of stakeholders, to the dissemination and implementation of the results. The Method Application Cards, for each analysed ES, detail the applied method in terms of its data, and resources requirement, links and dependency on other methods, collaboration level needed, and spatial scale of application, among others.

**ESMERALDA resources**

Case studies overview

Methods applied

**Other resources**

OPENESS case studies

OPERAs case studies

MOVE Project

MOVE-ON Project




The **MOVE pilot project** intends to involve policy makers, researchers and the civil society in the development of methodologies for Mapping and Assessment of Ecosystems and their Services (MAES) in the European Union Overseas entities, including Outermost Regions (ORs) and Overseas Countries and Territories (OCTs). The case studies implemented within the project, cover terrestrial and coastal/marine ecosystem services in several ORs and OCTs, demonstrating how MAES can be implemented and applied to address specific problems, supporting the development of solutions adjusted to EU Overseas entities needs.

Built upon the work, results and lessons learned from MOVE, the **MOVE-ON pilot project** aims to develop anchor projects dedicated to advance MAES implementation in EU ORs and OCTs. These projects will cover both marine and terrestrial ecosystems in different geographical locations and scales, encompassing the entire spectrum from methodological development to decision-making support. The MOVE-ON project intends to contribute to the EU and International policies and goals, developing and disseminating good practice guidelines and policy recommendations, improving the health status of ecosystems in these territories.

Each **MOVE Case Study Booklet** illustrates the study area, the objectives and research questions, the methods and materials for ecosystem services, mapping and assessment, data sources and stakeholder involvement process. The results contribute to advancement of biodiversity policy implementation and sustainable development, aiming to support decision-making in EU Overseas.

Access to  
**case studies**  
from  
**ESMERALDA,**  
**OPENESS**  
**OPERAs,**  
**MOVE** and  
**MOVE-ON**

Figure 13. Step 4: Method application.

## **Step 5. MAES case study applications**

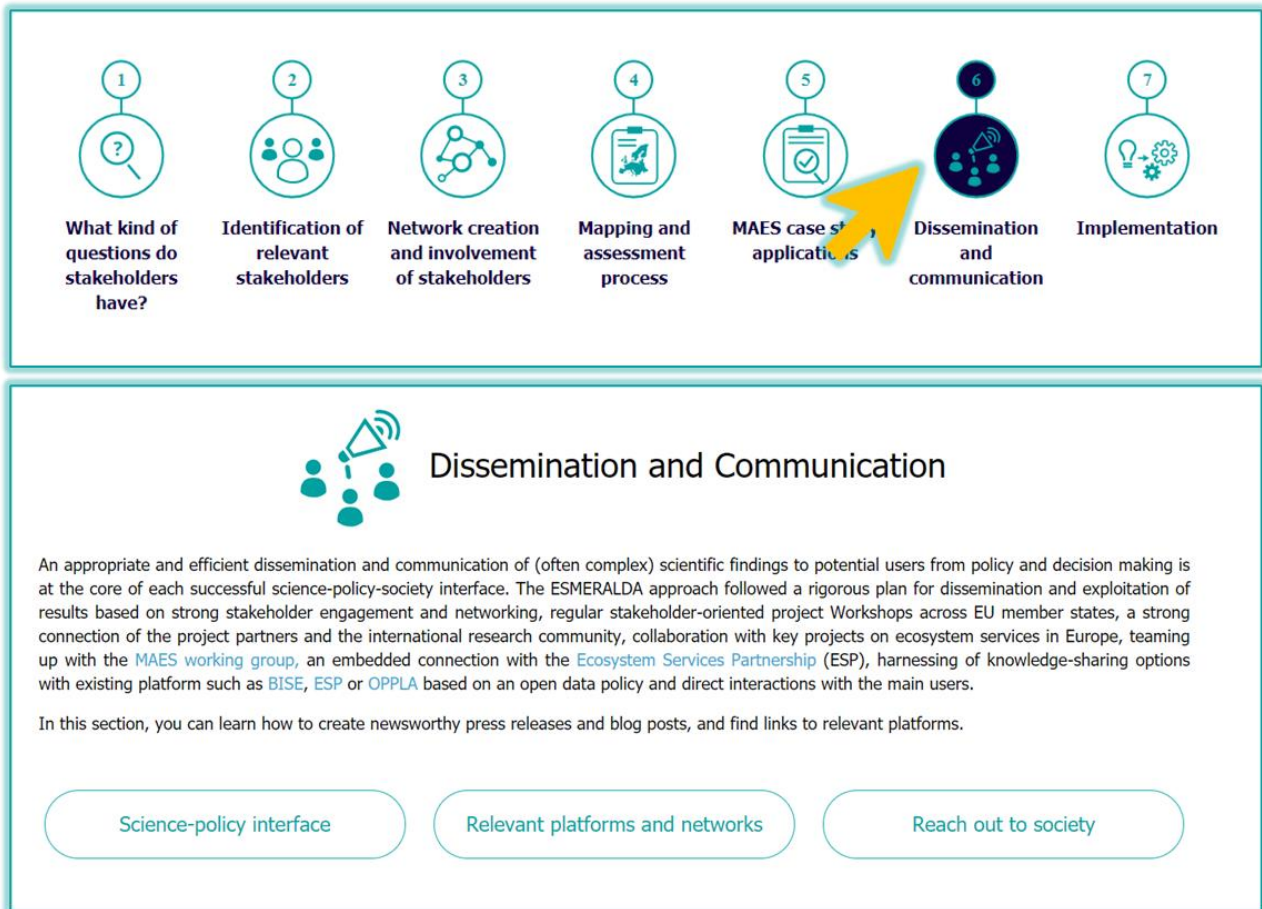
This section provides access to case studies from ESMERALDA, OPENNESS, OPERAs, and MOVE. The next outcomes pend to load are the MOVE-ON results when they are completed. In this sense, two new buttons were created to give access to the MOVE and MOVE-ON websites repositories (**Figure 14**).



Figure 14. Step 5: MAES case study applications.

## e. Step 6. Dissemination and Communication

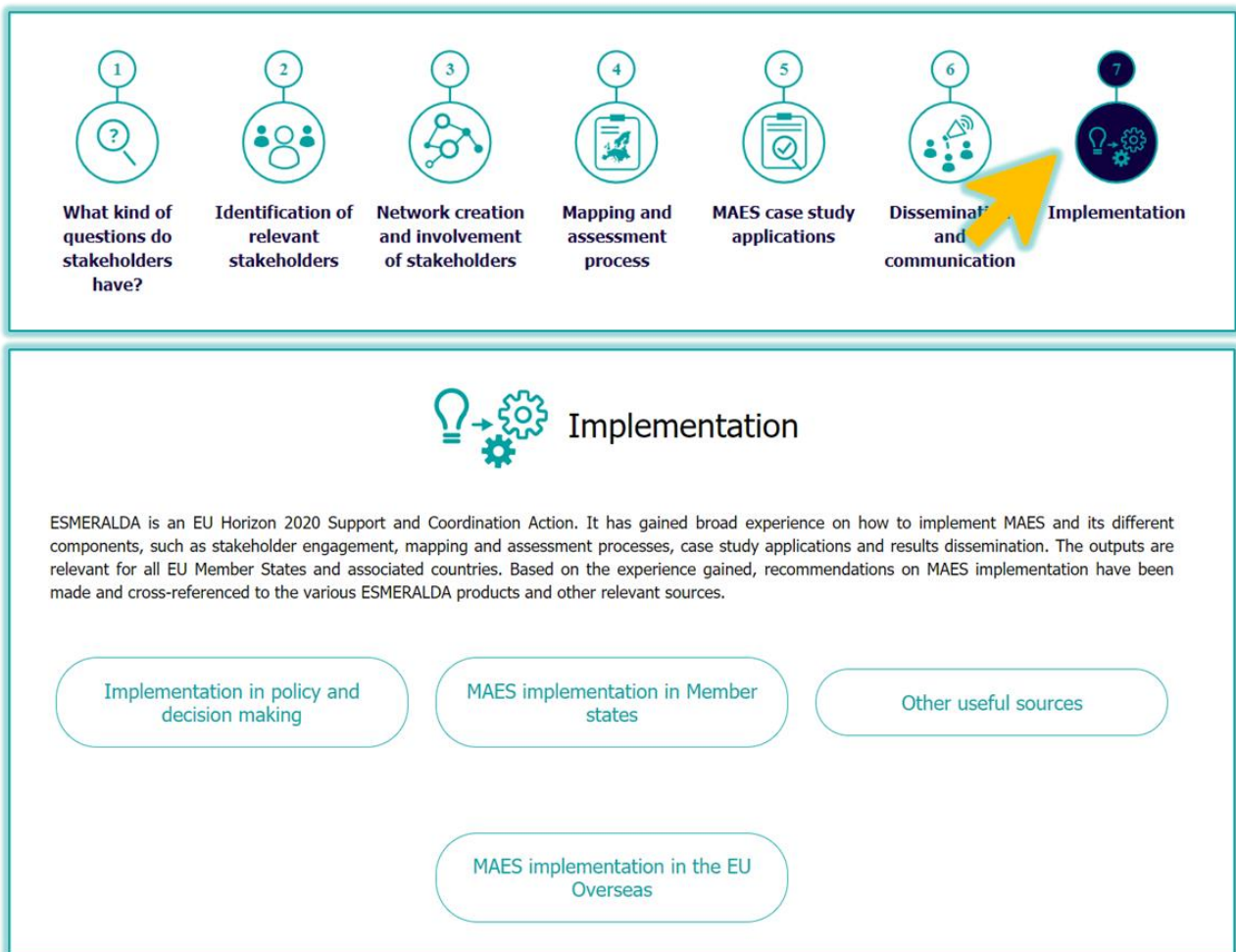
In this step users can learn how to create newsworthy press releases and blog posts and find links to relevant platforms.



**Figure 15.** Step 6: Dissemination and Communication

## f. Step 7. Implementation

Finally, this step provides several sources and recommendations to implement MAES and its different components, such as stakeholder engagement, mapping and assessment processes, case study applications and dissemination of results. This section also provides implementation examples in various policy and decision-making contexts.



**Figure 16.** Step 7. Implementation

### 3. CONCLUSIONS

The MAES Methods Explorer is an interactive tool that allows users to identify different methods applied to map and assess services provided by various ecosystems. This tool assists researchers and practitioners to implement MAES process at different scales and levels, ranging from national policy to local spatial planning. The tool is designed for users who want to support the sustainable use of resources, understand the condition of ecosystems and the services they provide, and the socio-cultural and economic values associated with them. However, due to the complexity of the assessments, additional experts' guidance is needed to select appropriate applicable methods according to the data and resources available in the anchor project.

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